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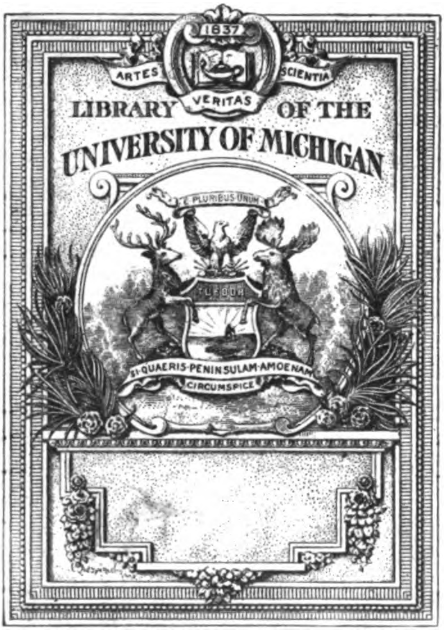

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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1914

PUBLISHED BY THE NAUTICAL ALMANAC OFFICE, U. S.
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DEPARTMENT OF THE NAVY
BUREAU OF NAVIGATION

WASHINGTON
GOVERNMENT PRINTING OFFICE
1911

PREFACE.

The character of the matter contained in this issue of the American Ephemeris and Nautical Almanac, and its arrangement, are the same as in the preceding volume, that for the year 1913.

The volume is divided into three parts, as follows:

Part I, *Ephemeris for the Meridian of Greenwich*, which gives the ephemerides of the Sun and Moon, the geocentric and heliocentric positions of the major planets, the Sun's coordinates, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, which gives ephemerides of the fixed stars, Sun, Moon, and major planets for transit over the meridian of the Naval Observatory, Washington, which passes midway between the West and East Transit Circles of the Observatory. The mean places of the fixed stars and the data for their reduction are also included in this part.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Washington mean time for the meridian of the Naval Observatory is used throughout this part except in a few cases, notably those of eclipses, where Greenwich mean time seems more convenient. Tables for the determination of latitude and azimuth from Polaris, tables for the conversion of time, and an alphabetical list of observatories with their latitudes, longitudes, and other data, are contained in this part.

W. S. EICHELBERGER,
Professor of Mathematics, U. S. Navy,
Director Nautical Almanac.

WASHINGTON, *October, 1911.*

ERRATA.

Star List of The American Ephemeris, 1910.

Page.

130, Add to the R. A. of α Canis Majoris, $+0^{s}.09$, except on Feb. 9, July 28, Sept. 6, Dec. 25 and 35, on which dates $+0^{s}.08$ should be added.

Add to the Decl. of α Canis Majoris $+0''.5$, except on Mar. 21, 31, May 30, Aug. 7, 17, Sept. 6, 16, Oct. 16, Nov. 5, 15, and Dec. 25, on which dates $+0''.4$ should be added.

137, Add to the R. A. of α Canis Minoris, $-0^{s}.01$, on Jan. 10, 20, Mar. 11, 21, 31, Apr. 10, 30, May 10, 20, 30, June 9, 19, Aug. 17, 27, Sept. 6, 16, 26, Oct. 6, Dec. 5 and 15.

Add to the Decl. of α Canis Minoris, $+0''.2$, except on Jan. 10, Mar. 1, 11, 21, 31, Apr. 10, May 30, Aug. 17, 27, Sept. 6, 16, Oct. 16, Nov. 15, 25, Dec. 5, 15 and 25, on which dates $+0''.1$ should be added.

Star List of the American Ephemeris, 1911.

130, Add to the R. A. of α Canis Majoris, $+0^{s}.09$, except on Jan. 20 and June 29, on which dates $+0^{s}.08$ should be added.

Add to the Decl. of α Canis Majoris, $+0''.5$, except on Feb. 9, 19, Mar. 1, 11, May 10, 20, July 9, 19, Aug. 7, 17, 27, and Oct. 16, on which dates $+0''.4$ should be added.

137, Add to the R. A. of α Canis Minoris, $-0^{s}.01$, on Jan. 10, Feb. 9, 19, Mar. 21, 31, Apr. 10, May 30, June 29, July 9, Sept. 16, 26, Oct. 6, Nov. 5, 15, Dec. 5, 15, 25, and 35.

Add to the Decl. of α Canis Minoris, $+0''.2$, except on Feb. 19, Mar. 1, 11, Apr. 30, May 10, Oct. 16, 26, Nov. 5 and 25, on which dates $+0''.1$ should be added.

The American Ephemeris, 1911.

200, Add to Semidiameter of Sun $+0''.01$ on Dec. 23, 29, 30, 31, $+0''.02$ on Dec. 24, 27, 28, 32, and $+0''.03$ on Dec. 25, 26.

The American Ephemeris, 1912.

2, Add to Semidiameter of Sun $+0''.02$ on Jan. 1, 2, 3.

345, Add to the R. A. of α Canis Majoris, $+0^{s}.09$, except on Jan. 0, Mar. 30, Apr. 9, May 29, July 8, Aug. 6, 16, Sept. 25, and Oct. 5, on which dates $+0^{s}.08$ should be added.

Add to the Decl. of α Canis Majoris, $+0''.5$, except on Jan. 0, 30, Apr. 29, June 28, July 8, Oct. 15, 25, Nov. 4, 14, and 24, on which dates $+0''.4$ should be added.

352, Add to the R. A. of α Canis Minoris, $-0^{s}.01$, on Jan. 10, 20, 30, Feb. 9, 19, 29, Mar. 10, 20, 30, Apr. 9, 19, 29, June 8, 18, 28, July 8, Oct. 15, Dec. 14, and 24.

Add to the Decl. of α Canis Minoris, $+0''.2$, except on Jan. 30, Feb. 9, 19, 29, Mar. 10, 20, Apr. 29, Sept. 15 and 25, on which dates $+0''.1$ should be added.

710. Twenty-fifth line, log ξ . . . . . *for* 9.3102 *n* *read* 9.3102

For other errata, 1912, see page iv of *The American Ephemeris, 1913.*

The American Ephemeris, 1913.

197. Dec. 32 . . . . *for* 0.9118980 *read* 0.9118982

243. Thirty-eighth line . . . . *for* ζ Libræ, Mag. 5.6 *read* 32 Libræ, Mag. 5.9

345, Add to the R. A. of α Canis Majoris, $+0^{s}.09$, except on Feb. 19, May 10, Oct. 16, 26, and Nov. 5, on which dates $+0^{s}.08$ should be added.

Add to the Decl. of α Canis Majoris, $+0''.5$, except on Jan. 10, 30, Apr. 20, Aug. 7, 17, Sept. 16, Nov. 5, and 15, on which dates $+0''.4$ should be added.

352, Add to the R. A. of α Canis Minoris, $-0^{s}.01$, on Jan. 0, 30, Feb. 9, 19, Mar. 1, 11, 21, 31, May 10, June 19, 29, July 9, 29, Aug. 7, 17, 27, Sept. 6, Oct. 6, 16, and Dec. 25.

Add to the Decl. of α Canis Minoris, $+0''.2$, except on Jan. 30, Mar. 11, 21, 31, May 10, 20, 30, July 9, 19, 29, Aug. 7, 17, 27, Nov. 5, 15, 25, and Dec. 5, on which dates $+0''.1$ should be added.

411, First star . . . . *for* ζ Libræ, Mag. 5.6 *read* 32 Libræ, Mag. 5.9

726, Last line . . . . *for* $18^{m}.3$ *and* $5^{m}.0$ *read* $21^{m}.9$ *and* $8^{m}.6$

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ANNIVERSARIES AND FESTIVALS, 1914.

New Year's Day	Thursday,	Jan.	1.
Epiphany	Tuesday,	Jan.	6.
Septuagesima Sunday	Sunday,	Feb.	8.
Lincoln's Birthday	Thursday,	Feb.	12.
Washington's Birthday	Sunday,	Feb.	22.
Quinquagesima (Shrove Sunday)	Sunday,	Feb.	22.
Ash Wednesday	Wednesday,	Feb.	25.
Palm Sunday	Sunday,	Apr.	5.
Good Friday	Friday,	Apr.	10.
First Day of Passover	Saturday,	Apr.	11.
Easter Sunday	Sunday,	Apr.	12.
Rogation Sunday	Sunday,	May	17.
Ascension Day (Holy Thursday)	Thursday,	May	21.
Memorial Day	Saturday,	May	30.
Hebrew Pentecost (Shebuoth)	Sunday,	May	31.
Pentecost (Whit Sunday)	Sunday,	May	31.
Trinity Sunday	Sunday,	June	7.
Corpus Christi	Thursday,	June	11.
Independence Day	Saturday,	July	4.
Labor Day (except in certain States)	Monday,	Sept.	7.
Day of Atonement (Yom Kippur)	Wednesday,	Sept.	30.
First Day of Tabernacle (Sucoth)	Monday,	Oct.	5.
General Election Day (except in certain States)	Tuesday,	Nov.	3.
Thanksgiving Day	Thursday,	Nov.	26.
First Sunday in Advent	Sunday,	Nov.	29.
Christmas Day	Friday,	Dec.	25.

INTRODUCTION.

The Ephemeris for the Meridian of Greenwich, comprising Part I of this volume, has been constructed from various tables of the Sun, Moon, and planets, as stated below, and the ephemerides of these bodies for the meridian of Washington contained in Part II have been computed from the same tables.

The Ephemeris of the Sun is constructed from Professor NEWCOMB'S *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is $8''.80$, *Paris Conference, May, 1896.*

The Sun's rectangular equatorial coordinates are computed from the longitudes and latitudes by the following formulæ:

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3\, R\, \beta \\ Z &= R \sin \lambda \sin \omega + 44.5\, R\, \beta \end{aligned}$$

The reductions to mean equinox are computed by the formulæ—

$$\begin{aligned} \Delta X &= + Y \sec \omega\, \Delta\lambda \sin 1'' \\ \Delta Y &= - X \cos \omega\, \Delta\lambda \sin 1'' + Z \Delta\omega \sin 1'' + 9.1\, \tau R \sin(\lambda + 6^\circ) \\ \Delta Z &= - X \sin \omega\, \Delta\lambda \sin 1'' - Y \Delta\omega \sin 1'' - 21.0\, \tau R \sin(\lambda + 6^\circ) \end{aligned}$$

where the numerical coefficients are in units of the seventh place of decimals and

R = the Sun's radius vector,
λ = the Sun's true longitude,
β = the Sun's true latitude, expressed in seconds of arc,
ω = the obliquity of the ecliptic,
$\Delta\lambda$ = the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year,
$\Delta\omega$ = the reduction of the mean to the apparent obliquity,
τ = the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from HANSEN'S *Tables de la Lune* (London, 1857), the mean longitude being corrected as in previous years, beginning with the volume for the year 1883. The statement concerning these corrections which is contained in the volumes from 1883 to 1911, inclusive, is erroneous, in that they have not been computed strictly in accordance with the formula in NEWCOMB'S *Researches on the Motion of the Moon*, part 1, page 268, *Washington Observations*, 1875, Appendix II. That formula is,

$$- 1''.14 - 29''.17\, T - 3''.86\, T^2 - V_2 - 0''.09 \sin A - 15''.49 \cos A,$$

while the expression actually used is,

$$- 1''.14 - 29''.17\, T - 3''.76\, T^2 - V_2 - 15''.49 \cos A.$$

In these formulæ T is the time in units of 100 years reckoned from 1800.

The ephemerides of Mercury, Venus, and Mars are derived from Professor NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VI, parts 2, 3, and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by Dr. GEORGE W. HILL, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from Professor NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 3 and 4.

The nutation used in computing the ephemerides of the Sun, Moon, and planets has been taken from Tables XXXII and XXXIII of NEWCOMB'S Tables of the Sun, *Astronomical Papers of the American Ephemeris*, Vol. VI, part 1, and is given at intervals of five days on page 214. The formulæ from which the nutation is computed are as follows, the time interval T being expressed in units of 100 years, reckoned from 1900. See *Tables of the Sun*, page 26.

$$\begin{aligned} \delta\psi = & -(17''.234+0''.017\,T)\sin \text{☊} \\ & +\ 0''.209 \sin 2\,\text{☊} \\ & -\ 1''.257 \sin 2\,L \\ & -\ 0''.049 \sin (3\,L+78^\circ.7) \\ & +\ 0''.110 \sin (L+75^\circ.3) \end{aligned}$$

$$\begin{aligned} \delta\varepsilon = & +9''.214 \cos \text{☊} \\ & -0''.090 \cos 2\,\text{☊} \\ & +0''.546 \cos 2\,L \\ & +0''.021 \cos (3\,L+78^\circ.7) \\ & -0''.009 \cos (L-78^\circ.7) \end{aligned}$$

The formulæ for the nutation used in computing the Besselian and Independent Star Numbers, pages 218–229, are as follows:

Terms of Long Period.

$$\begin{aligned} \delta\psi = & -(17''.234+0''.017\,T)\sin \text{☊} \\ & +\ 0''.209 \sin 2\,\text{☊} \\ & -\ 1''.272 \sin 2\,L \\ & +\ 0''.126 \sin (L-\Gamma) \\ & -\ 0''.050 \sin (3\,L-\Gamma) \\ & +\ 0''.021 \sin (L+\Gamma) \\ & +\ 0''.012 \sin (2\,L-\text{☊}) \end{aligned}$$

$$\begin{aligned} \delta\varepsilon = & +\ (9''.210+0''.0009\,T)\cos \text{☊} \\ & -\ 0''.090 \cos 2\,\text{☊} \\ & +\ 0''.552 \cos 2\,L \\ & +\ 0''.022 \cos (3\,L-\Gamma) \\ & -\ 0''.009 \cos (L+\Gamma) \\ & -\ 0''.007 \cos (2\,L-\text{☊}) \end{aligned}$$

Terms of Short Period.

$$\begin{aligned} & -0''.204 \sin 2\,\text{☾} \\ & +0''.011 \sin (\text{☾}+\Gamma') \\ & +0''.068 \sin (\text{☾}-\Gamma') \\ & -0''.034 \sin (2\,\text{☾}-\text{☊}) \\ & -0''.026 \sin (3\,\text{☾}-\Gamma') \\ & +0''.015 \sin (\text{☾}-2\,L+\Gamma') \\ & +0''.006 \sin 2\,(\text{☾}-L) \end{aligned}$$

$$\begin{aligned} & +0''.088 \cos 2\,\text{☾} \\ & +0''.018 \cos (2\,\text{☾}-\text{☊}) \\ & +0''.011 \cos (3\,\text{☾}-\Gamma') \\ & -0''.005 \cos (\text{☾}+\Gamma') \end{aligned}$$

The meaning of the symbols used and the manner in which these latter formulæ have been employed in computing the ephemerides of the stars, pages 251 to 510, are explained on pages 216 and 217. The slight discrepancy between the terms in 2 L in these two sets of formulæ is due to the correction of an error in the first set. See *Bulletin Astronomique*, 1898, Vol. XV, page 244.

The list of 825 stars contained in Part II has been selected from NEWCOMB'S Catalogue of Fundamental Stars, *Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2. The mean places and annual variations of the stars have been taken from NEWCOMB'S Catalogue, except that those of ε Hydri, 38 Horologii (G.), and π Centauri have been taken from *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33.

The relative accuracy with which the places of the stars are determined in both right ascension and declination may be estimated approximately from the mean errors for the year 1920, given on pages 511–517, and taken from *Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2, pages 370–382.

The constants of aberration, precession, nutation, and obliquity of the ecliptic, used in the reduction of stars to apparent place, are given on pages 213 and 214, and the formulæ for the computation of the Besselian and Independent Star Numbers are given on page 216, the coefficients being those given by Professor NEWCOMB in *Bulletin Astronomique*, 1898, Vol. XV, page 241.

The terms of short period of the nutation depending on the Moon's mean longitude are tabulated for Washington mean midnight of each day on pages 231–232, and have been computed from the formulæ for these terms given above.

The method by which the right ascensions and declinations of the stars interpolated from the 10-day ephemerides (pp. 287–486) are corrected for the effect of these short-period terms is given on page 217.

According to the formulæ on pages 216 and 217 the star constants a, b, c, d, a', b', c', d' are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second-order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

To $\alpha-\alpha_0$

$$\begin{array}{l}
\text{s} \\
\left.\begin{array}{l} +0.000\,003\,\tau^2\sin\alpha \\ -0.000\,149\,\tau^2\cos\alpha \end{array}\right\}\tan\delta \\
\left.\begin{array}{l} -0.000\,0650\,\tau^2\sin 2\alpha \\ +0.000\,0103\sin 2\,\text{☊}\cos 2\alpha \\ -0.000\,0107\cos 2\,\text{☊}\sin 2\alpha \end{array}\right\}\tan{}^2\delta \\
\left.\begin{array}{l} +0.000\,0620\sin 2\odot\cos 2\alpha \\ -0.000\,0602\cos 2\odot\sin 2\alpha \end{array}\right\}\sec{}^2\delta \\
\left.\begin{array}{l} +0.000\,0513\sin(\odot+\text{☊})\cos 2\alpha \\ -0.000\,0507\cos(\odot+\text{☊})\sin 2\alpha \\ +0.000\,0097\sin(\odot-\text{☊})\cos 2\alpha \\ -0.000\,0053\cos(\odot-\text{☊})\sin 2\alpha \end{array}\right\}\tan\delta\sec\delta
\end{array}$$

To $\delta-\delta_0$

$$\begin{array}{l}
'' \\
\left.\begin{array}{l} +0.000\,975\,\tau^2\sin{}^2\alpha \\ -0.000\,023\cos 2\,\text{☊} \\ -0.000\,080\cos 2\,\text{☊}\cos 2\alpha \\ -0.000\,077\sin 2\,\text{☊}\sin 2\alpha \\ +0.000\,040\cos 2\odot \\ -0.000\,467\cos 2\odot\cos 2\alpha \\ -0.000\,465\sin 2\odot\sin 2\alpha \end{array}\right\}\tan\delta \\
\left.\begin{array}{l} -0.000\,039\cos(\odot+\text{☊}) \\ -0.000\,380\cos(\odot+\text{☊})\cos 2\alpha \\ -0.000\,385\sin(\odot+\text{☊})\sin 2\alpha \\ -0.000\,380\cos(\odot-\text{☊}) \\ -0.000\,040\cos(\odot-\text{☊})\cos 2\alpha \\ -0.000\,072\sin(\odot-\text{☊})\sin 2\alpha \end{array}\right\}\sin\delta\tan\delta
\end{array}$$

These terms are negligible for stars whose declination is numerically less than 80°, but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), α^2 Centauri, and 61 Cygni have been corrected for the effect of annual parallax, the adopted constants of parallax being $0''.38$, $0''.27$, $0''.75$, and $0''.40$, respectively.

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), and α^2 Centauri, have been corrected for the effect of orbital motion. AUWER's elements were used for Sirius and Procyon, and SEE's elements for α^2 Centauri. The values of these corrections are given on pages 98 and 99 of *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33, but those for Sirius and Procyon need an additional correction to refer them to the center of the orbit before they are applicable to the mean places taken from NEWCOMB's Fundamental Catalogue. These additional corrections for Sirius and Procyon were omitted in the Star List [Supplement to the American Ephemeris and Nautical Almanac] for 1910 and 1911, and in the American Ephemeris and Nautical Almanac for 1912 and 1913. The values of the corrections for the three stars are—

	Sirius.		Procyon.		α^2 Centauri.	
	1914.0	1915.0	1914.0	1915.0	1914.0	1915.0
$\Delta\alpha$	$-0^{s}.138$	$-0^{s}.140$	$-0^{s}058$	$-0^{s}.061$	$+0^{s}.678$	$+0^{s}.669$
$\Delta\delta$	$-0''.18$	$-0''.32$	$-0''.31$	$-0''.20$	$+6''.76$	$+6''.51$

The values of $\Delta\alpha$ and $\Delta\delta$ which are given for the companions to the stars γ Andromedæ, ζ Ursæ Majoris and 61 Cygni, have been taken from the Greenwich 10-year catalogue for 1890, those for α Crucis from the Cape Catalogue for 1900, and those for α^2 Geminorum from Doberck's elements in the *Astronomische Nachrichten*, 1904, Vol. 166, page 145.

The magnitudes of the stars have, with a few exceptions, been taken from *Annals of the Harvard College Observatory*, Vol. L, 1908.

In general, the names of the stars are the same as in Newcomb's Suggested List of Fundamental Stars, except that the Flamsteed number has been omitted in all cases where Greek or italic letters are available. In some cases the constellation and number of the uranometries of Heis or Gould have been used. In all such cases, Heis or the letter G in parentheses follows the constellation name, as, for example, 5 Cassiopeiæ (Heis) and 38 Horologii (G.).

The stars occulted by the Moon, pages 566–569, have been selected from the catalogue of zodiacal stars contained in Vol. VIII, part 3, *Astronomical Papers of the American Ephemeris*, and the mean places for 1914.0 have been derived from the same catalogue.

In Part III the elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with Bessel's method, the special forms employed being a modification of those developed in Chauvenet's *Spherical and Practical Astronomy*.

In the computation of the elements of Eclipses, the following corrections to the longitude, latitude, and parallax of the Moon, deduced by the late Prof. Simon Newcomb from recent observations of occultations of stars by the Moon, have been applied. These corrections have been assumed in each case to be constant during the eclipse.

G. M. T.	δv	δb	$\delta \pi$
1914.	″	″	″
Feb. 24^d 11^h	+8.4	−0.1	+0.4
Mar. 11 17	+8.3	+0.5	+0.3
Aug. 21 0	+8.8	+0.5	+0.4
Sept. 4 2	+8.9	−0.2	+0.4

The satellites of Mars are computed from manuscript tables based upon elements deduced by Professor Walter S. Harshman, U. S. N.

The eclipses of Jupiter's satellites are computed from a *Continuation of* Damoiseau's *Tables*. The occultations, transits, etc., are computed from Woolhouse's tables, published in the *British Nautical Almanac* for 1835; Table II of each satellite having been adapted to Damoiseau's tables.

The Vth satellite of Jupiter is computed from manuscript tables based upon unpublished elements deduced from the observations of Professor E. E. Barnard.

The differential coordinates of Jupiter's VIth and VIIth satellites have been computed from elements and tables published in *Lick Observatory Bulletin*, 1906, Vol. IV, No. 112, and in *Astronomische Nachrichten*, 1907, Vol. 174, page 359, respectively.

The elongations and conjunctions of the satellites and the positions of the rings of Saturn are computed from manuscript tables based on Professer H. Struve's elements as published in *Observations de Poulkova*, Supplement 1, St. Petersburg, 1888; *Publications de Poulkovo*, Second Series, Vol. XI, St. Petersburg, 1898; and *Astronomische Nachrichten*, 1903, Vol. 162, pages 325–344. The differential coordinates of Phœbe have been computed from elements and tables printed in the *Annals of Harvard College Observatory*, 1905, Vol. LIII, No. VI.

The apparent dimensions of the rings of Saturn are computed from BESSEL'S data, except those for the dusky ring, which are based on the observations of various astronomers.

The elongations of the satellites of Uranus are computed from the data of Professor NEWCOMB'S *Uranian and Neptunian Systems, Washington Observations*, 1873, Appendix I.

The elongations of the satellite of Neptune are computed from manuscript tables based upon the late Professor A. HALL'S elements published in the *Astronomical Journal*, 1898, Vol. XIX, page 65.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is 16′ 1″.50; while in the computation of eclipses the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Vol. 128, page 367, is employed, viz., 15′ 59″.63.

In the computation of the ephemeris for physical observations of the Sun, page 609, the following elements by CARRINGTON have been used:

Inclination of the Sun's equator to the ecliptic	7° 15′
Longitude of the ascending node of the Sun's equator on the ecliptic	$73° 40' + 50''.25 (t - 1850)$
Sidereal period of rotation (mean solar days)	$25^d.38$

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π, by the formula,

$$S = 0.272\,506\,\pi + 1''.50$$

where the constant 0.272 506 is based on data from occultations given by Mr. J. PETERS in the *Astronomische Nachrichten*, 1895, Vol. 138, page 147; and the constant 1″.50 is added to cover the average effect of irradiation.

The value of the Moon's semidiameter employed in the computation of eclipses is computed from the formula,

$$S = 0.272\,274\,\pi$$

The ephemeris for physical observations of the Moon, pages 610–617, has been computed from formulæ and elements given by F. HAYN in *Abhandlungen der K. Sächsischen Gesell. der Wissenschaften*, Vols. 29 and 30, 1904, 1907.

The notation used for the geocentric librations of the Moon is as follows:

I = the mean inclination of the Moon's equator to the ecliptic (= 1° 32′.1),
Ω = the mean longitude of the Moon's ascending node, or the mean longitude of the descending node of the Moon's equator,
C = the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,
$\lambda, \beta, \alpha, \delta$ = the geocentric longitude, latitude, right ascension, and declination of the Moon,
$i, \Delta, \Omega', ☾$ = the quantities defined on page 212, where their values for the current year are given,
g' = Earth's mean anomaly,
g = Moon's mean anomaly,
ω = Angular distance of Moon's perigee from the ascending node,
b, l = Optical librations in latitude and longitude, respectively,
$\delta b, \delta l$ = Physical librations in latitude and longitude, respectively,
δC = Physical libration of C.

The Moon's geocentric librations in longitude and latitude or, in other words, the earth's selenographic longitude and latitude, are equal to $l + \delta l$ and $b + \delta b$, respectively, and may be found, for any time, by means of the following formulæ, in connection with the tables given on pages 212 and 213:—

$$
\begin{aligned}
\mu &= -0'.617 \sin 2\,(\Omega - \lambda) \\
A &= \sin I \cos\,(\Omega - \lambda) \\
\tan B &= \tan I \sin\,(\Omega - \lambda) \\
\lambda' &= \lambda + \mu + Ab \\
b &= B - \beta \\
l &= \lambda' - \text{☾} \\
\sin C &= \sin i\,\frac{\cos\,(\lambda' + \Delta - \Omega)}{\cos \delta} = -\sin i\,\frac{\cos\,(\alpha - \Omega')}{\cos b} \\
\delta b &= +108'' \sin\,(\omega + l) + 37'' \sin\,(\omega - l) - 11'' \sin\,(g + \omega - l) \\
\delta l &= +12'' \sin g - 59'' \sin g' - 18'' \sin 2\omega \\
&\quad - [108'' \cos\,(\omega + l) - 37'' \cos\,(\omega - l) + 11'' \cos\,(g + \omega - l)] \tan b \\
\delta C &= -[108'' \cos\,(\omega + l) - 37'' \cos\,(\omega - l) + 11'' \cos\,(g + \omega - l)] \sec b
\end{aligned}
$$

The Sun's selenographic latitude and longitude have been computed from formulæ the same as those given above except that the heliocentric coordinates of the Moon have been substituted for the geocentric coordinates.

The following elements have been used in computing the ephemerides for physical observations of the planets Mars and Jupiter:

Position of north pole of Mars		$\alpha = 21^h\ 10^m\ 0^s + 1^s.565(t - 1905)$ $\delta = 54^\circ\ 30'\ 0'' + 12''.60(t - 1905)$
Position of north pole of Jupiter		$\alpha = 17^h\ 52^m\ 0^s.84 + 0^s.247(t - 1910)$ $\delta = 64^\circ\ 33'\ 34''.6 - 0''.60(t - 1910)$
Rotation period of Mars		$24^h\ 37^m\ 22^s.65$
Rotation period of Jupiter	Equatorial region	$9^h\ 50^m\ 30^s.004$
	Great Red Spot	$9^h\ 55^m\ 40^s.340$
Longitude of Central Meridian of Mars, May 15, 1897, Greenwich Mean Noon		$52^\circ.01$
Longitude of Central Meridian of Jupiter (Equatorial Region), July 14, 1897, Greenwich Mean Noon		$47^\circ.31$
Longitude of Great Red Spot from Central Meridian of Jupiter, January 1, 1908, Greenwich Mean Noon		$120^\circ.49$

The position of the north pole of Mars is as given by LOWELL and CROMMELIN (see *Monthly Notices R. A. S.*, 1905, Vol. 66, page 56), while that of the north pole of Jupiter has been deduced from the position given by DAMOISEAU for 1750 (see *Tables Écliptiques des Satellites de Jupiter*, page (1)). The rotation periods of Mars and of the equatorial region of Jupiter and the longitudes of the central meridians of Mars and of the equatorial region of Jupiter are according to MARTH (see *Monthly Notices R. A. S.*, 1896, Vol. 56, pages 395–403 and 517–524). The rotation period of the Great Red Spot of Jupiter is a recent value by BARNARD, and its longitude from the Central Meridian is deduced from observations by BARNARD published in *Astronomische Nachrichten*, 1908, Vol. 178, page 390.

The adopted semidiameters of the planets are given on page xv, and their stellar magnitudes have been computed from formulæ given by Dr. G. MUELLER in *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, 1893, Vol. 8, page 366.

In the list of observatories, pages 670–679, the latitudes given are in most cases astronomical. In some instances they have been determined by geodetic triangulation from other points. The reductions from geographic to geocentric latitude, $\varphi' - \varphi$, and the distance from the center of the earth, ρ, are computed from the formulæ for CLARKE's Spheroid of 1866 as given on page xiv.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1914, WHICH COMPRISES THE LATTER PART OF THE 138TH AND THE BEGINNING OF THE 139TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6627 of the Julian Period;

" 7422–7423 of the Byzantine era, the year 7423 commencing on September 1;

" 5674–5675 of the Jewish era, the year 5675 commencing on September 21, or, more exactly, at sunset on September 20;

" 2667 since the foundation of Rome, according to VARRO;

" 2661 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding, in the notation of chronologists, to the 747th, and, in the notation of astronomers, to the 746th year before the birth of CHRIST;

" 2690 of the Olympiads, or the second year of the 673d Olympiad, commencing in July, 1914, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;

" 2226 of the Grecian era, or the era of the SELEUCIDÆ, which began near the vernal equinox of the year, $-311 =$ B. C. 312, $=4402$ of the Julian Period;

" 1630 of the era of DIOCLETIAN;

" 2574 of the Japanese era and to the 47th year of the period entitled "Meiji."

The year 1333 of the Mohammedan era, or the era of the Hegira, begins on the 19th day of November, 1914.

The first day of January of the year 1914 is the 2,420,134th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	D	Solar Cycle	19
Epact	3	Roman Indiction	12
Lunar Cycle or Golden Number	15	Julian Period	6627

ASTRONOMICAL CONSTANTS.

Solar Parallax	$8''.80$	Paris Conference.
Constant of Nutation	$9''.21$	
Constant of Aberration	$20''.47$	
General Precession	$50''.2564 + 0''.000\,222(t-1900)$	Newcomb.
Obliquity of the Ecliptic	$23^\circ\,27'\,8''.26 - 0''.4684(t-1900)$	
Equatorial Horizontal Parallax of the Moon	$57'\,2''.63$*	(Newcomb).

Mean distance Earth to Moon 384 395 kilometers = 238 851 miles, or 60.2669 radii.

Mean distance Earth to Sun 149 499 935 kilometers = 92 894 767 statute miles.

Velocity of light 299 860 kilometers = 186 324 statute miles per second (Newcomb and Michelson).

Light travels unit distance in $498^{s}.566$.

Gaussian Gravitation Constant, †$k = 0.017\,202\,099 = 3\,548''.187\,61$.

Acceleration in one sec. due to gravity,	$g = \overset{m}{9.8060} - \overset{m}{0.0260} \cos 2\varphi - \frac{2h}{R} g$.‡	Helmert.
Length of seconds pendulum,	$l = \overset{m}{0.993\,549} - \overset{m}{0.002\,631} \cos 2\varphi - \frac{2h}{R} l$.‡	

Length of the year:

	d	
Tropical (ordinary)	365.242 198 79 − 0.000 000 0614 (t − 1900)	Newcomb.
Sidereal	365.256 360 42 + 0.000 000 0011 (t − 1900)	
Anomalistic	365.259 641 34 + 0.000 000 0304 (t − 1900)	
Eclipse	346.620 000 + 0.000 000 36 (t − 1900)	

Length of the month:

	d	d	h	m	s	
Synodical (ordinary)	29.530 588	= 29	12	44	2.8	Hansen.
Tropical	27.321 582	= 27	7	43	4.7	
Sidereal	27.321 661	= 27	7	43	11.5	
Anomalistic	27.554 550	= 27	13	18	33.1	
Nodical	27.212 219	= 27	5	5	35.7	

Length of the day:

	h	m	s	
Sidereal	23	56	4.091	of mean solar time.
Mean Solar	24	3	56.555	of sidereal time.

Dimensions of the Earth (Clarke's Spheroid of 1866):

Equatorial Radius, $a = 6378.206$ kilometers or 3963.23 statute miles.

Polar Radius, $b = 6356.584$ " or 3949.79 " "

Flattening, $\frac{a-b}{a} = \frac{1}{295.0}$

Logarithm of the eccentricity $\frac{\sqrt{a^2-b^2}}{a} = \log e = 8.915\,251\,28$

Logarithm radius $= \log \rho = 9.999\,2645 + 0.000\,7374 \cos 2\varphi - 0.000\,0019 \cos 4\varphi$.

Reduction from geographic latitude φ to geocentric latitude φ',

$$\varphi' - \varphi = -11'\,40''.44 \sin 2\varphi + 1''.19 \sin 4\varphi.$$

1 meter = 3.280 8333 feet. 1 foot = 0.304 8006 meters.

1 statute mile = 0.868 392 nautical or geographical miles.

1 nautical mile = 1.151 553 statute miles.

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* Used in the computation of eclipses. The parallax used in the computation of the ephemeris of the Moon contained in this volume is $57'\,2''.23$ (Hansen).

† k^2 is the acceleration due to the Sun's attraction at the mean distance of the Earth from the Sun, which is also the astronomical unit of distance, the unit of time being one mean solar day.

‡ φ = latitude, h = elevation above sea level in meters, and log R = 6.80416.

ASTRONOMICAL CONSTANTS.

SEMIDIAMETERS OF THE SUN, MOON, AND PLANETS.

Name.	At unit Distance.	At mean least Distance.	In Kilometers.	In Statute Miles.	Authority.
	′ ″	″			
Sun	15 59.63	. .	695 533.61	432 183.68	Auwers.
Moon	15 32.58*	. .	1 737.96	1 079.91	Newcomb.
Mercury	3.34	5.45	2 420.82	1 504.24	Le Verrier.
Venus	8.55	30.90	6 197.01	3 850.67	Peirce.
Mars	5.05	9.64	3 660.22	2 274.37	Peirce.
Jupiter (Equatorial)	1 40.20	23.84	72 624.56	45 127.16	Am. Eph.
Jupiter (Polar)	1 34.12	22.40	68 217.80	42 388.90	Peirce.
Saturn (Equatorial)	1 24.88	9.94	61 520.69	38 227.48	Barnard.
Saturn (Polar)	1 17.47	9.07	56 149.95	34 890.23	Barnard.
Uranus	33.52	1.84	24 295.16	15 096.43	Am. Eph.
Neptune	38.66	1.33	28 020.61	17 411.34	Am. Eph.

ELEMENTS OF THE PLANETARY ORBITS FOR THE EPOCH 1914—January 0^d G. M. T.

Name.	Mean Distance.	Sidereal Period in Tropical Years.	Sidereal mean daily Motion.	Synodic Period in Tropical Years.	Eccentricity.
			″		
☿ Mercury	0.387 099	0.240 85	14 732.420	0.317 26	0.205 6171
♀ Venus	0.723 331	0.615 21	5 767.670	1.598 72	0.006 8140
⊕ Earth	1.000 000	1.000 04	3 548.193	. . .	0.016 7452
♂ Mars	1.523 688	1.880 89	1 886.519	2.135 39	0.093 3216
♃ Jupiter	5.202 803	11.862 23	299.128	1.092 11	0.048 3603
♄ Saturn	9.538 843	29.457 72	120.455	1.035 18	0.055 8413
♅ Uranus	19.190 978	84.015 29	42.23	1.012 09	0.047 0837
♆ Neptune	30.070 672	164.788 29	21.53	1.006 14	0.008 5421

Name.	Inclination to the Ecliptic.	Mean Longitude of the Node.	Mean Longitude of the Perihelion.	Mean Longitude at the Epoch.	Logarithm of Mass in Unit of Sun's Mass.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	
☿ Mercury	7 0 11.3	47 18 42.7	76 7 2.8	222 30 10.10	3.221 8487 − 10
♀ Venus	3 23 37.6	75 54 20.2	130 21 39.3	254 39 20.31	4.389 3398 − 10
⊕ Earth	. . .	. . .	101 27 41.4	99 18 41.43	4.482 2896 − 10
♂ Mars	1 51 1.0	48 53 38.1	334 28 34.2	93 19 24.52	3.509 5499 − 10
♃ Jupiter	1 18 28.7	99 34 46.0	12 56 13.8	303 5 26.10	6.979 9082 − 10
♄ Saturn	2 29 30.3	112 54 20.4	91 21 46.9	77 50 23.24	6.455 7335 − 10
♅ Uranus	0 46 21.9	73 33 38.4	169 16 21.0	303 32 34.20	5.640 7528 − 10
♆ Neptune	1 46 40.5	130 49 58.0	43 52 40.7	115 48 11.51	5.705 5338 − 10

The elements of the four inner planets are derived from those given by Newcomb in Vol. VI of the Astronomical Papers of the American Ephemeris, and are the same as those used in computing the ephemerides of these planets. Those of Jupiter, Saturn, Uranus, and Neptune are taken from Vol. VII of the Astronomical Papers for the epoch of the tables. They are reduced to 1914 by applying Le Verrier's variations, and can not be regarded as being strictly identical with the elements used in computing the ephemerides of those planets in this volume.

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* At mean distance. See Ast. Papers Am. Eph., Vol. IX, p. 40. For the values of the semidiameter used in this volume see page xi.

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	⛢	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittarius.
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricornus.
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌	Conjunction, or having the same Longitude or Right Ascension.
□	Quadrature, or differing ±90° in Longitude or Right Ascension.
☍	Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	^{h}	Hours.
E.	East.	^{m}	Minutes of Time.
W.	West.	^{s}	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	18 44 38.04	11.051	S. 23 3 22.2	+11.79	16 17.86	71.07	3 27.30	1.191
Frid.	2	18 49 3.12	11.037	22 58 25.5	12.94	16 17.86	71.03	3 55.74	1.177
Sat.	3	18 53 27.84	11.022	22 53 1.3	14.08	16 17.87	70.98	4 23.82	1.162
SUN.	4	18 57 52.17	11.005	22 47 9.8	+15.21	16 17.87	70.93	4 51.52	1.145
Mon.	5	19 2 16.08	10.987	22 40 51.2	16.34	16 17.86	70.87	5 18.80	1.127
Tues.	6	19 6 39.55	10.968	22 34 5.7	17.45	16 17.85	70.81	5 45.63	1.108
Wed.	7	19 11 2.54	10.948	22 26 53.4	+18.56	16 17.84	70.75	6 11.98	1.088
Thur.	8	19 15 25.04	10.926	22 19 14.6	19.66	16 17.82	70.68	6 37.84	1.066
Frid.	9	19 19 47.00	10.904	22 11 9.5	20.75	16 17.79	70.61	7 3.18	1.044
Sat.	10	19 24 8.41	10.880	22 2 38.5	+21.83	16 17.75	70.54	7 27.97	1.021
SUN.	11	19 28 29.26	10.856	21 53 41.7	22.90	16 17.71	70.46	7 52.20	0.997
Mon.	12	19 32 49.53	10.831	21 44 19.3	23.96	16 17.67	70.38	8 15.84	0.973
Tues.	13	19 37 9.19	10.806	21 34 31.6	+25.00	16 17.61	70.30	8 38.88	0.947
Wed.	14	19 41 28.22	10.780	21 24 18.9	26.04	16 17.55	70.21	9 1.30	0.921
Thur.	15	19 45 46.62	10.753	21 13 41.5	27.06	16 17.49	70.12	9 23.09	0.894
Frid.	16	19 50 4.38	10.726	21 2 39.6	+28.08	16 17.41	70.03	9 44.22	0.867
Sat.	17	19 54 21.47	10.698	20 51 13.5	29.09	16 17.33	69.93	10 4.69	0.839
SUN.	18	19 58 37.87	10.669	20 39 23.6	30.08	16 17.25	69.83	10 24.48	0.810
Mon.	19	20 2 53.56	10.640	20 27 10.1	+31.05	16 17.16	69.73	10 43.57	0.780
Tues.	20	20 7 8.55	10.610	20 14 33.3	32.01	16 17.07	69.63	11 1.95	0.750
Wed.	21	20 11 22.81	10.579	20 1 33.6	32.96	16 16.97	69.53	11 19.60	0.720
Thur.	22	20 15 36.33	10.547	19 48 11.5	+33.89	16 16.87	69.42	11 36.51	0.689
Frid.	23	20 19 49.09	10.515	19 34 27.2	34.80	16 16.76	69.31	11 52.67	0.657
Sat.	24	20 24 1.07	10.483	19 20 21.0	35.70	16 16.65	69.20	12 8.06	0.625
SUN.	25	20 28 12.28	10.450	19 5 53.3	+36.59	16 16.54	69.09	12 22.66	0.592
Mon.	26	20 32 22.69	10.417	18 51 4.6	37.46	16 16.42	68.98	12 36.47	0.559
Tues.	27	20 36 32.29	10.384	18 35 55.3	38.31	16 16.30	68.87	12 49.48	0.525
Wed.	28	20 40 41.08	10.349	18 20 25.8	+39.14	16 16.18	68.76	13 1.67	0.491
Thur.	29	20 44 49.04	10.314	18 4 36.5	39.96	16 16.06	68.65	13 13.04	0.457
Frid.	30	20 48 56.16	10.279	17 48 27.7	40.76	16 15.93	68.53	13 23.58	0.422
Sat.	31	20 53 2.45	10.244	17 32 0.0	41.54	16 15.80	68.42	13 33.29	0.387
SUN.	32	20 57 7.89	10.209	S. 17 15 13.8	+42.31	16 15.66	68.30	13 42.16	0.352

Note.—The mean time of semidiameter passing meridian may be found by subtracting $0^s.19$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	18 44 37.41	11.048	S. 23 3 22.9	+11.78	3 27.23	1.191	18 41 10.18
Frid.	2	18 49 2.40	11.034	22 58 26.4	12.93	3 55.66	1.177	18 45 6.74
Sat.	3	18 53 27.03	11.018	22 53 2.3	14.07	4 23.73	1.162	18 49 3.30
SUN.	4	18 57 51.28	11.002	22 47 11.0	+15.20	4 51.42	1.145	18 52 59.86
Mon.	5	19 2 15.11	10.984	22 40 52.6	16.33	5 18.69	1.127	18 56 56.42
Tues.	6	19 6 38.50	10.965	22 34 7.3	17.44	5 45.52	1.108	19 0 52.98
Wed.	7	19 11 1.41	10.944	22 26 55.2	+18.55	6 11.87	1.088	19 4 49.54
Thur.	8	19 15 23.83	10.923	22 19 16.7	19.65	6 37.73	1.066	19 8 46.10
Frid.	9	19 19 45.72	10.901	22 11 12.0	20.74	7 3.06	1.044	19 12 42.66
Sat.	10	19 24 7.06	10.878	22 2 41.2	+21.82	7 27.85	1.021	19 16 39.21
SUN.	11	19 28 27.84	10.854	21 53 44.6	22.89	7 52.07	0.997	19 20 35.77
Mon.	12	19 32 48.04	10.829	21 44 22.5	23.95	8 15.71	0.973	19 24 32.33
Tues.	13	19 37 7.64	10.803	21 34 35.1	+24.99	8 38.75	0.947	19 28 28.89
Wed.	14	19 41 26.61	10.777	21 24 22.7	26.03	9 1.17	0.921	19 32 25.45
Thur.	15	19 45 44.95	10.750	21 13 45.6	27.05	9 22.95	0.894	19 36 22.00
Frid.	16	19 50 2.64	10.723	21 2 44.1	+28.07	9 44.08	0.867	19 40 18.56
Sat.	17	19 54 19.67	10.695	20 51 18.4	29.07	10 4.55	0.839	19 44 15.12
SUN.	18	19 58 36.02	10.667	20 39 28.8	30.06	10 24.34	0.810	19 48 11.68
Mon.	19	20 2 51.66	10.638	20 27 15.6	+31.03	10 43.43	0.780	19 52 8.24
Tues.	20	20 7 6.60	10.608	20 14 39.1	31.99	11 1.81	0.750	19 56 4.80
Wed.	21	20 11 20.82	10.577	20 1 39.8	32.94	11 19.46	0.720	20 0 1.35
Thur.	22	20 15 34.29	10.546	19 48 18.0	+33.87	11 36.38	0.689	20 3 57.91
Frid.	23	20 19 47.01	10.514	19 34 34.0	34.78	11 52.54	0.657	20 7 54.47
Sat.	24	20 23 58.96	10.482	19 20 28.1	35.69	12 7.93	0.625	20 11 51.03
SUN.	25	20 28 10.13	10.449	19 6 0.8	+36.58	12 22.54	0.592	20 15 47.58
Mon.	26	20 32 20.50	10.415	18 51 12.5	37.45	12 36.36	0.559	20 19 44.14
Tues.	27	20 36 30.07	10.382	18 36 3.5	38.30	12 49.37	0.525	20 23 40.70
Wed.	28	20 40 38.83	10.348	18 20 34.3	+39.13	13 1.57	0.491	20 27 37.26
Thur.	29	20 44 46.76	10.314	18 4 45.3	39.95	13 12.94	0.457	20 31 33.81
Frid.	30	20 48 53.86	10.279	17 48 36.8	40.75	13 23.49	0.422	20 35 30.37
Sat.	31	20 53 0.13	10.244	17 32 9.4	41.53	13 33.20	0.387	20 39 26.93
SUN.	32	20 57 5.56	10.209	S. 17 15 23.4	+42.30	13 42.08	0.352	20 43 23.48

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour, +9ˢ.8565. (Table III.)

		AT GREENWICH MEAN NOON.						
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		True Longitude.		Diff. for 1 Hour.	Latitude.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	1	280 15 37.7	15 33.8	152.94	−0.07	9.992 6726	− 2.0	5 17 57.58
2	2	281 16 48.1	16 44.0	152.93	+0.06	9.992 6687	1.2	5 14 1.67
3	3	282 17 58.2	17 54.0	152.92	0.18	9.992 6668	− 0.3	5 10 5.76
4	4	283 19 8.1	19 3.7	152.91	+0.30	9.992 6671	+ 0.6	5 6 9.84
5	5	284 20 17.7	20 13.0	152.89	0.41	9.992 6697	1.6	5 2 13.93
6	6	285 21 26.9	21 22.0	152.88	0.50	9.992 6746	2.6	4 58 18.02
7	7	286 22 35.7	22 30.6	152.86	+0.57	9.992 6820	+ 3.6	4 54 22.10
8	8	287 23 44.1	23 38.8	152.84	0.61	9.992 6919	4.7	4 50 26.19
9	9	288 24 52.0	24 46.6	152.82	0.63	9.992 7045	5.8	4 46 30.28
10	10	289 25 59.5	25 53.9	152.80	+0.62	9.992 7198	+ 7.0	4 42 34.37
11	11	290 27 6.6	27 0.8	152.79	0.57	9.992 7380	8.2	4 38 38.46
12	12	291 28 13.3	28 7.3	152.77	0.50	9.992 7590	9.4	4 34 42.54
13	13	292 29 19.7	29 13.5	152.76	+0.40	9.992 7829	+10.6	4 30 46.63
14	14	293 30 25.7	30 19.3	152.75	0.29	9.992 8096	11.7	4 26 50.72
15	15	294 31 31.5	31 24.9	152.74	0.16	9.992 8392	12.9	4 22 54.80
16	16	295 32 37.0	32 30.2	152.72	+0.02	9.992 8714	+14.0	4 18 58.89
17	17	296 33 42.2	33 35.2	152.71	−0.12	9.992 9062	15.0	4 15 2.98
18	18	297 34 47.2	34 40.0	152.70	0.23	9.992 9434	16.0	4 11 7.07
19	19	298 35 51.8	35 44.5	152.69	−0.33	9.992 9829	+16.9	4 7 11.16
20	20	299 36 56.2	36 48.7	152.67	0.41	9.993 0244	17.7	4 3 15.24
21	21	300 38 0.1	37 52.5	152.65	0.47	9.993 0679	18.5	3 59 19.33
22	22	301 39 3.7	38 55.8	152.63	−0.48	9.993 1131	+19.2	3 55 23.42
23	23	302 40 6.7	39 58.7	152.61	0.46	9.993 1600	19.9	3 51 27.51
24	24	303 41 9.1	41 0.9	152.58	0.42	9.993 2086	20.5	3 47 31.60
25	25	304 42 10.7	42 2.4	152.55	−0.35	9.993 2586	+21.2	3 43 35.68
26	26	305 43 11.6	43 3.1	152.52	0.26	9.993 3102	21.8	3 39 39.77
27	27	306 44 11.6	44 2.9	152.48	0.15	9.993 3631	22.4	3 35 43.86
28	28	307 45 10.6	45 1.8	152.44	−0.03	9.993 4176	+23.0	3 31 47.95
29	29	308 46 8.5	45 59.5	152.39	+0.09	9.993 4736	23.7	3 27 52.04
30	30	309 47 5.3	46 56.1	152.34	0.23	9.993 5312	24.3	3 23 56.13
31	31	310 48 0.9	47 51.6	152.29	0.35	9.993 5904	25.0	3 20 0.22
32	32	311 48 55.2	48 45.7	152.23	+0.46	9.993 6512	+25.7	3 16 4.31

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour, $-9^{s}.8296$. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 55.7	14 52.9	54 41.52	−0.950	54 31.18	−0.770	4 2.6	1.69	4.9
2	14 50.7	14 49.2	54 23.09	0.576	54 17.40	−0.371	4 42.3	1.63	5.9
3	14 48.3	14 48.1	54 14.22	−0.157	54 13.65	+0.063	5 21.1	1.62	6.9
4	14 48.7	14 50.0	54 15.73	+0.284	54 20.47	+0.505	6 0.2	1.66	7.9
5	14 52.0	14 54.7	54 27.84	0.722	54 37.76	0.931	6 41.0	1.75	8.9
6	14 58.1	15 2.1	54 50.13	1.128	55 4.76	1.308	7 24.5	1.89	9.9
7	15 6.6	15 11.7	55 21.45	+1.470	55 39.95	+1.609	8 11.8	2.06	10.9
8	15 17.1	15 22.9	55 59.96	1.720	56 21.12	1.802	9 3.6	2.25	11.9
9	15 28.9	15 34.9	56 43.07	1.850	57 5.38	1.862	9 59.7	2.41	12.9
10	15 41.0	15 46.9	57 27.60	+1.836	57 49.29	+1.773	10 58.9	2.49	13.9
11	15 52.6	15 57.8	58 10.01	1.674	58 29.32	1.540	11 58.8	2.47	14.9
12	16 2.6	16 6.8	58 46.84	1.375	59 2.22	1.186	12 57.1	2.37	15.9
13	16 10.3	16 13.2	59 15.22	+0.979	59 25.66	+0.759	13 52.5	2.24	16.9
14	16 15.3	16 16.7	59 33.42	0.535	59 38.52	+0.315	14 44.6	2.11	17.9
15	16 17.3	16 17.3	59 41.02	+0.104	59 41.06	−0.093	15 34.1	2.03	18.9
16	16 16.7	16 15.6	59 38.85	−0.272	59 34.61	−0.430	16 22.3	2.00	19.9
17	16 14.0	16 11.9	59 28.62	0.565	59 21.13	0.680	17 10.6	2.03	20.9
18	16 9.5	16 6.9	59 12.37	0.776	59 2.57	0.853	18 0.3	2.12	21.9
19	16 4.0	16 0.9	58 51.95	−0.915	58 40.66	−0.966	18 52.4	2.24	22.9
20	15 57.7	15 54.3	58 28.81	1.008	58 16.50	1.043	19 47.6	2.36	23.9
21	15 50.9	15 47.3	58 3.80	1.074	57 50.74	1.103	20 45.4	2.44	24.9
22	15 43.6	15 39.9	57 37.34	−1.130	57 23.63	−1.155	21 44.2	2.45	25.9
23	15 36.1	15 32.2	57 9.62	1.180	56 55.33	1.201	22 42.1	2.36	26.9
24	15 28.2	15 24.2	56 40.81	1.218	56 26.13	1.228	23 37.0	2.20	27.9
25	15 20.2	15 16.2	56 11.38	−1.230	55 56.66	−1.222	☌	. .	28.9
26	15 12.2	15 8.4	55 42.11	1.201	55 27.90	1.165	0 27.7	2.02	0.2
27	15 4.6	15 1.1	55 14.22	1.113	55 1.26	1.045	1 14.3	1.86	1.2
28	14 57.8	14 54.9	54 49.22	−0.959	54 38.32	−0.855	1 57.4	1.74	2.2
29	14 52.3	14 50.1	54 28.77	0.733	54 20.79	0.594	2 38.0	1.65	3.2
30	14 48.4	14 47.2	54 14.58	0.438	54 10.33	−0.268	3 17.2	1.62	4.2
31	14 46.6	14 46.7	54 8.21	−0.084	54 8.36	+0.111	3 56.1	1.63	5.2
32	14 47.4	14 48.8	54 10.92	+0.316	54 15.98	+0.528	4 35.9	1.69	6.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 1.					SATURDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 37 6.22	1.8208	S. 9 40 24.6	13.634	0	0 1 43.45	1.7358	N. 1 31 6.2	14.074
1	22 38 55.36	1.8172	9 26 45.7	13.661	1	0 3 27.60	1.7359	1 45 10.4	14.067
2	22 40 44.28	1.8136	9 13 5.3	13.687	2	0 5 11.76	1.7362	1 59 14.2	14.059
3	22 42 32.99	1.8101	8 59 23.3	13.713	3	0 6 55.94	1.7365	2 13 17.5	14.051
4	22 44 21.49	1.8067	8 45 39.8	13.737	4	0 8 40.14	1.7369	2 27 20.3	14.042
5	22 46 9.79	1.8033	8 31 54.9	13.760	5	0 10 24.37	1.7374	2 41 22.5	14.032
6	22 47 57.89	1.8001	8 18 8.6	13.782	6	0 12 8.63	1.7380	2 55 24.1	14.022
7	22 49 45.80	1.7969	8 4 21.1	13.803	7	0 13 52.93	1.7387	3 9 25.1	14.011
8	22 51 33.52	1.7939	7 50 32.2	13.825	8	0 15 37.27	1.7394	3 23 25.4	13.998
9	22 53 21.07	1.7909	7 36 42.1	13.846	9	0 17 21.66	1.7403	3 37 24.9	13.986
10	22 55 8.43	1.7879	7 22 50.7	13.865	10	0 19 6.10	1.7412	3 51 23.7	13.973
11	22 56 55.62	1.7851	7 8 58.3	13.883	11	0 20 50.60	1.7422	4 5 21.7	13.959
12	22 58 42.64	1.7823	6 55 4.8	13.901	12	0 22 35.16	1.7432	4 19 18.8	13.944
13	23 0 29.50	1.7797	6 41 10.2	13.918	13	0 24 19.78	1.7443	4 33 15.0	13.930
14	23 2 16.20	1.7770	6 27 14.6	13.934	14	0 26 4.48	1.7456	4 47 10.4	13.915
15	23 4 2.74	1.7744	6 13 18.1	13.950	15	0 27 49.25	1.7468	5 1 4.8	13.898
16	23 5 49.13	1.7720	5 59 20.6	13.965	16	0 29 34.10	1.7483	5 14 58.1	13.880
17	23 7 35.38	1.7697	5 45 22.3	13.978	17	0 31 19.04	1.7498	5 28 50.4	13.863
18	23 9 21.49	1.7673	5 31 23.2	13.992	18	0 33 4.07	1.7513	5 42 41.7	13.846
19	23 11 7.46	1.7651	5 17 23.3	14.004	19	0 34 49.19	1.7528	5 56 31.9	13.827
20	23 12 53.30	1.7630	5 3 22.7	14.017	20	0 36 34.41	1.7546	6 10 20.9	13.807
21	23 14 39.02	1.7610	4 49 21.3	14.028	21	0 38 19.74	1.7563	6 24 8.7	13.787
22	23 16 24.62	1.7590	4 35 19.3	14.038	22	0 40 5.17	1.7582	6 37 55.3	13.766
23	23 18 10.10	1.7571	S. 4 21 16.7	14.048	23	0 41 50.72	1.7602	N. 6 51 40.6	13.744
	FRIDAY 2.					SUNDAY 4.			
0	23 19 55.47	1.7553	S. 4 7 13.6	14.057	0	0 43 36.39	1.7622	N. 7 5 24.6	13.722
1	23 21 40.73	1.7535	3 53 9.9	14.065	1	0 45 22.18	1.7643	7 19 7.2	13.699
2	23 23 25.89	1.7519	3 39 5.8	14.073	2	0 47 8.10	1.7664	7 32 48.5	13.676
3	23 25 10.96	1.7503	3 25 1.2	14.080	3	0 48 54.15	1.7687	7 46 28.3	13.652
4	23 26 55.93	1.7488	3 10 56.2	14.086	4	0 50 40.34	1.7710	8 0 6.7	13.627
5	23 28 40.82	1.7474	2 56 50.9	14.092	5	0 52 26.67	1.7734	8 13 43.5	13.601
6	23 30 25.62	1.7460	2 42 45.2	14.097	6	0 54 13.15	1.7759	8 27 18.8	13.575
7	23 32 10.34	1.7448	2 28 39.3	14.101	7	0 55 59.78	1.7785	8 40 52.5	13.548
8	23 33 55.00	1.7437	2 14 33.1	14.105	8	0 57 46.57	1.7812	8 54 24.6	13.521
9	23 35 39.58	1.7425	2 0 26.7	14.108	9	0 59 33.52	1.7838	9 7 55.0	13.492
10	23 37 24.10	1.7416	1 46 20.2	14.110	10	1 1 20.63	1.7867	9 21 23.6	13.463
11	23 39 8.57	1.7407	1 32 13.5	14.112	11	1 3 7.92	1.7896	9 34 50.5	13.433
12	23 40 52.98	1.7398	1 18 6.8	14.113	12	1 4 55.38	1.7925	9 48 15.6	13.403
13	23 42 37.34	1.7389	1 4 0.0	14.113	13	1 6 43.02	1.7955	10 1 38.8	13.371
14	23 44 21.65	1.7383	0 49 53.2	14.113	14	1 8 30.84	1.7987	10 15 0.1	13.338
15	23 46 5.93	1.7377	0 35 46.5	14.112	15	1 10 18.86	1.8019	10 28 19.4	13.306
16	23 47 50.17	1.7372	0 21 39.8	14.110	16	1 12 7.07	1.8052	10 41 36.8	13.273
17	23 49 34.39	1.7367	S. 0 7 33.3	14.108	17	1 13 55.48	1.8085	10 54 52.2	13.238
18	23 51 18.57	1.7363	N. 0 6 33.1	14.105	18	1 15 44.09	1.8119	11 8 5.4	13.203
19	23 53 2.74	1.7360	0 20 39.3	14.102	19	1 17 32.91	1.8154	11 21 16.5	13.168
20	23 54 46.89	1.7358	0 34 45.3	14.098	20	1 19 21.94	1.8190	11 34 25.5	13.131
21	23 56 31.04	1.7357	0 48 51.0	14.093	21	1 21 11.19	1.8227	11 47 32.2	13.093
22	23 58 15.17	1.7356	1 2 56.5	14.088	22	1 23 0.66	1.8264	12 0 36.7	13.055
23	23 59 59.31	1.7357	1 17 1.5	14.081	23	1 24 50.36	1.8303	12 13 38.8	13.016
24	0 1 43.45	1.7358	N. 1 31 6.2	14.074	24	1 26 40.29	1.8341	N. 12 26 38.6	12.976

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 5.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	1 26 40.29	1.8341	N. 12 26 38.6	12.976
1	1 28 30.45	1.8381	12 39 35.9	12.935
2	1 30 20.86	1.8422	12 52 30.8	12.894
3	1 32 11.51	1.8463	13 5 23.2	12.852
4	1 34 2.41	1.8504	13 18 13.0	12.808
5	1 35 53.56	1.8547	13 31 0.2	12.765
6	1 37 44.97	1.8590	13 43 44.8	12.720
7	1 39 36.64	1.8634	13 56 26.6	12.674
8	1 41 28.58	1.8679	14 9 5.7	12.628
9	1 43 20.79	1.8725	14 21 41.9	12.580
10	1 45 13.28	1.8772	14 34 15.3	12.532
11	1 47 6.05	1.8819	14 46 45.7	12.482
12	1 48 59.11	1.8867	14 59 13.1	12.432
13	1 50 52.45	1.8915	15 11 37.5	12.381
14	1 52 46.09	1.8964	15 23 58.8	12.328
15	1 54 40.02	1.9014	15 36 16.9	12.275
16	1 56 34.26	1.9065	15 48 31.8	12.222
17	1 58 28.80	1.9116	16 0 43.5	12.168
18	2 0 23.65	1.9168	16 12 51.9	12.112
19	2 2 18.81	1.9221	16 24 56.9	12.054
20	2 4 14.30	1.9275	16 36 58.4	11.996
21	2 6 10.11	1.9329	16 48 56.4	11.938
22	2 8 6.25	1.9383	17 0 50.9	11.878
23	2 10 2.71	1.9438	N. 17 12 41.8	11.818

TUESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	2 11 59.51	1.9495	N. 17 24 29.0	11.756
1	2 13 56.65	1.9552	17 36 12.5	11.693
2	2 15 54.13	1.9608	17 47 52.1	11.628
3	2 17 51.95	1.9667	17 59 27.9	11.563
4	2 19 50.13	1.9726	18 10 59.7	11.497
5	2 21 48.66	1.9785	18 22 27.5	11.430
6	2 23 47.55	1.9845	18 33 51.3	11.362
7	2 25 46.80	1.9905	18 45 10.9	11.293
8	2 27 46.41	1.9966	18 56 26.4	11.223
9	2 29 46.39	2.0028	19 7 37.6	11.151
10	2 31 46.75	2.0090	19 18 44.5	11.078
11	2 33 47.47	2.0153	19 29 47.0	11.004
12	2 35 48.58	2.0216	19 40 45.0	10.929
13	2 37 50.06	2.0279	19 51 38.5	10.853
14	2 39 51.93	2.0344	20 2 27.4	10.776
15	2 41 54.19	2.0408	20 13 11.6	10.697
16	2 43 56.83	2.0473	20 23 51.0	10.618
17	2 45 59.87	2.0540	20 34 25.7	10.537
18	2 48 3.31	2.0606	20 44 55.4	10.454
19	2 50 7.14	2.0673	20 55 20.2	10.372
20	2 52 11.38	2.0740	21 5 40.0	10.287
21	2 54 16.02	2.0807	21 15 54.6	10.201
22	2 56 21.06	2.0874	21 26 4.1	10.114
23	2 58 26.51	2.0943	21 36 8.3	10.026
24	3 0 32.38	2.1013	N. 21 46 7.2	9.937

WEDNESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	3 0 32.38	2.1013	N. 21 46 7.2	9.937
1	3 2 38.66	2.1081	21 56 0.7	9.846
2	3 4 45.35	2.1150	22 5 48.7	9.753
3	3 6 52.46	2.1220	22 15 31.1	9.660
4	3 8 59.99	2.1290	22 25 7.9	9.565
5	3 11 7.94	2.1360	22 34 38.9	9.469
6	3 13 16.31	2.1431	22 44 4.2	9.373
7	3 15 25.11	2.1502	22 53 23.6	9.273
8	3 17 34.33	2.1573	23 2 37.0	9.173
9	3 19 43.98	2.1644	23 11 44.4	9.073
10	3 21 54.06	2.1715	23 20 45.7	8.970
11	3 24 4.56	2.1787	23 29 40.8	8.867
12	3 26 15.50	2.1858	23 38 29.7	8.762
13	3 28 26.86	2.1930	23 47 12.2	8.654
14	3 30 38.66	2.2002	23 55 48.2	8.546
15	3 32 50.89	2.2074	24 4 17.7	8.437
16	3 35 3.55	2.2146	24 12 40.6	8.326
17	3 37 16.64	2.2218	24 20 56.8	8.214
18	3 39 30.17	2.2291	24 29 6.3	8.101
19	3 41 44.13	2.2363	24 37 8.9	7.986
20	3 43 58.52	2.2434	24 45 4.6	7.870
21	3 46 13.34	2.2506	24 52 53.3	7.752
22	3 48 28.59	2.2578	25 0 34.8	7.633
23	3 50 44.28	2.2650	N. 25 8 9.2	7.513

THURSDAY 8.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	3 53 0.39	2.2721	N. 25 15 36.3	7.391
1	3 55 16.93	2.2793	25 22 56.1	7.268
2	3 57 33.90	2.2863	25 30 8.4	7.143
3	3 59 51.29	2.2934	25 37 13.2	7.018
4	4 2 9.11	2.3005	25 44 10.5	6.890
5	4 4 27.35	2.3076	25 51 0.0	6.761
6	4 6 46.02	2.3146	25 57 41.8	6.632
7	4 9 5.10	2.3215	26 4 15.8	6.500
8	4 11 24.60	2.3284	26 10 41.8	6.367
9	4 13 44.51	2.3353	26 16 59.8	6.233
10	4 16 4.83	2.3421	26 23 9.7	6.097
11	4 18 25.56	2.3489	26 29 11.4	5.960
12	4 20 46.69	2.3556	26 35 4.9	5.823
13	4 23 8.23	2.3623	26 40 50.1	5.683
14	4 25 30.17	2.3689	26 46 26.8	5.541
15	4 27 52.50	2.3754	26 51 55.0	5.398
16	4 30 15.22	2.3819	26 57 14.6	5.255
17	4 32 38.33	2.3884	27 2 25.6	5.110
18	4 35 1.83	2.3948	27 7 27.8	4.963
19	4 37 25.70	2.4010	27 12 21.2	4.817
20	4 39 49.95	2.4073	27 17 5.8	4.668
21	4 42 14.57	2.4134	27 21 41.4	4.518
22	4 44 39.56	2.4195	27 26 7.9	4.366
23	4 47 4.91	2.4254	27 30 25.3	4.214
24	4 49 30.61	2.4313	N. 27 34 33.6	4.061

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 9.					**SUNDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 49 30.61	2.4313	N. 27 34 33.6	4.061	0	6 50 42.45	2.5639	N. 27 34 31.9	4.283
1	4 51 56.66	2.4371	27 38 32.6	3.905	1	6 53 16.26	2.5630	27 30 9.5	4.464
2	4 54 23.06	2.4428	27 42 22.2	3.748	2	6 55 50.01	2.5619	27 25 36.2	4.644
3	4 56 49.80	2.4484	27 46 2.4	3.592	3	6 58 23.69	2.5608	27 20 52.2	4.824
4	4 59 16.87	2.4539	27 49 33.2	3.433	4	7 0 57.30	2.5595	27 15 57.3	5.005
5	5 1 44.27	2.4593	27 52 54.4	3.273	5	7 3 30.83	2.5580	27 10 51.6	5.184
6	5 4 11.99	2.4646	27 56 6.0	3.113	6	7 6 4.26	2.5563	27 5 35.2	5.363
7	5 6 40.02	2.4698	27 59 7.9	2.951	7	7 8 37.59	2.5546	27 0 8.0	5.542
8	5 9 8.36	2.4748	28 2 0.1	2.788	8	7 11 10.81	2.5527	26 54 30.1	5.720
9	5 11 37.00	2.4798	28 4 42.5	2.624	9	7 13 43.91	2.5507	26 48 41.6	5.898
10	5 14 5.94	2.4847	28 7 15.0	2.459	10	7 16 16.89	2.5485	26 42 42.4	6.075
11	5 16 35.16	2.4893	28 9 37.6	2.293	11	7 18 49.73	2.5462	26 36 32.6	6.251
12	5 19 4.66	2.4939	28 11 50.2	2.127	12	7 21 22.43	2.5438	26 30 12.3	6.427
13	5 21 34.43	2.4984	28 13 52.8	1.958	13	7 23 54.98	2.5412	26 23 41.4	6.602
14	5 24 4.47	2.5028	28 15 45.2	1.788	14	7 26 27.37	2.5385	26 17 0.1	6.775
15	5 26 34.77	2.5071	28 17 27.4	1.619	15	7 28 59.60	2.5357	26 10 8.4	6.948
16	5 29 5.32	2.5112	28 18 59.5	1.449	16	7 31 31.65	2.5328	26 3 6.3	7.122
17	5 31 36.11	2.5151	28 20 21.3	1.278	17	7 34 3.53	2.5298	25 55 53.8	7.293
18	5 34 7.13	2.5188	28 21 32.8	1.105	18	7 36 35.22	2.5266	25 48 31.1	7.463
19	5 36 38.37	2.5225	28 22 33.9	0.933	19	7 39 6.72	2.5234	25 40 58.2	7.633
20	5 39 9.83	2.5261	28 23 24.6	0.758	20	7 41 38.02	2.5199	25 33 15.1	7.803
21	5 41 41.50	2.5295	28 24 4.9	0.584	21	7 44 9.11	2.5164	25 25 21.9	7.971
22	5 44 13.37	2.5328	28 24 34.7	0.408	22	7 46 39.99	2.5129	25 17 18.6	8.138
23	5 46 45.43	2.5359	N. 28 24 53.9	0.233	23	7 49 10.66	2.5092	N. 25 9 5.3	8.303
	SATURDAY 10.					**MONDAY 12.**			
0	5 49 17.68	2.5389	N. 28 25 2.6	+0.057	0	7 51 41.10	2.5053	N. 25 0 42.2	8.468
1	5 51 50.10	2.5417	28 25 0.7	−0.121	1	7 54 11.30	2.5014	24 52 9.1	8.632
2	5 54 22.68	2.5443	28 24 48.1	0.299	2	7 56 41.27	2.4975	24 43 26.3	8.794
3	5 56 55.42	2.5468	28 24 24.8	0.478	3	7 59 11.00	2.4934	24 34 33.8	8.956
4	5 59 28.30	2.5492	28 23 50.8	0.656	4	8 1 40.48	2.4893	24 25 31.6	9.117
5	6 2 1.32	2.5514	28 23 6.1	0.835	5	8 4 9.72	2.4852	24 16 19.8	9.276
6	6 4 34.47	2.5535	28 22 10.6	1.015	6	8 6 38.70	2.4808	24 6 58.5	9.433
7	6 7 7.74	2.5554	28 21 4.3	1.195	7	8 9 7.41	2.4763	23 57 27.8	9.590
8	6 9 41.12	2.5572	28 19 47.2	1.376	8	8 11 35.86	2.4719	23 47 47.7	9.745
9	6 12 14.60	2.5588	28 18 19.2	1.557	9	8 14 4.04	2.4673	23 37 58.4	9.899
10	6 14 48.17	2.5602	28 16 40.4	1.738	10	8 16 31.94	2.4628	23 27 59.8	10.052
11	6 17 21.82	2.5615	28 14 50.7	1.918	11	8 18 59.57	2.4582	23 17 52.1	10.203
12	6 19 55.55	2.5627	28 12 50.2	2.100	12	8 21 26.92	2.4535	23 7 35.4	10.353
13	6 22 29.34	2.5636	28 10 38.7	2.282	13	8 23 53.99	2.4487	22 57 9.7	10.502
14	6 25 3.18	2.5643	28 8 16.3	2.463	14	8 26 20.76	2.4438	22 46 35.2	10.649
15	6 27 37.06	2.5650	28 5 43.0	2.645	15	8 28 47.25	2.4390	22 35 51.8	10.795
16	6 30 10.98	2.5655	28 2 58.8	2.828	16	8 31 13.44	2.4340	22 24 59.8	10.939
17	6 32 44.92	2.5658	28 0 3.7	3.010	17	8 33 39.33	2.4291	22 13 59.1	11.083
18	6 35 18.88	2.5661	27 56 57.6	3.193	18	8 36 4.93	2.4241	22 2 49.9	11.224
19	6 37 52.85	2.5661	27 53 40.6	3.374	19	8 38 30.22	2.4190	21 51 32.2	11.363
20	6 40 26.81	2.5659	27 50 12.7	3.557	20	8 40 55.21	2.4139	21 40 6.3	11.502
21	6 43 0.76	2.5657	27 46 33.8	3.738	21	8 43 19.89	2.4088	21 28 32.0	11.639
22	6 45 34.69	2.5653	27 42 44.1	3.920	22	8 45 44.27	2.4038	21 16 49.6	11.774
23	6 48 8.59	2.5647	27 38 43.4	4.102	23	8 48 8.34	2.3986	21 4 59.1	11.908
24	6 50 42.45	2.5639	N. 27 34 31.9	4.283	24	8 50 32.10	2.3934	N. 20 53 0.6	12.041

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 13.					**THURSDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 50 32.10	2.3934	N. 20 53 0.6	12.041	0	10 39 40.21	2.1688	N. 9 14 55.3	16.380
1	8 52 55.55	2.3882	20 40 54.2	12.171	1	10 41 50.24	2.1654	8 58 31.0	16.428
2	8 55 18.68	2.3829	20 28 40.1	12.299	2	10 44 0.06	2.1621	8 42 3.9	16.474
3	8 57 41.50	2.3778	20 16 18.3	12.427	3	10 46 9.69	2.1589	8 25 34.1	16.519
4	9 0 4.01	2.3726	20 3 48.9	12.553	4	10 48 19.13	2.1558	8 9 1.6	16.563
5	9 2 26.21	2.3673	19 51 12.0	12.677	5	10 50 28.38	2.1527	7 52 26.6	16.603
6	9 4 48.09	2.3620	19 38 27.7	12.799	6	10 52 37.45	2.1497	7 35 49.2	16.643
7	9 7 9.65	2.3568	19 25 36.1	12.920	7	10 54 46.34	2.1468	7 19 9.5	16.681
8	9 9 30.90	2.3515	19 12 37.3	13.039	8	10 56 55.06	2.1439	7 2 27.5	16.717
9	9 11 51.83	2.3463	18 59 31.4	13.157	9	10 59 3.61	2.1412	6 45 43.5	16.751
10	9 14 12.45	2.3411	18 46 18.5	13.273	10	11 1 12.00	2.1386	6 28 57.4	16.784
11	9 16 32.76	2.3358	18 32 58.7	13.386	11	11 3 20.24	2.1360	6 12 9.4	16.815
12	9 18 52.75	2.3306	18 19 32.2	13.498	12	11 5 28.32	2.1334	5 55 19.6	16.844
13	9 21 12.43	2.3254	18 5 59.0	13.608	13	11 7 36.25	2.1311	5 38 28.1	16.872
14	9 23 31.80	2.3202	17 52 19.2	13.718	14	11 9 44.05	2.1288	5 21 35.0	16.898
15	9 25 50.85	2.3150	17 38 32.9	13.825	15	11 11 51.71	2.1266	5 4 40.3	16.923
16	9 28 9.60	2.3099	17 24 40.2	13.930	16	11 13 59.24	2.1243	4 47 44.2	16.946
17	9 30 28.04	2.3048	17 10 41.3	14.033	17	11 16 6.63	2.1222	4 30 46.8	16.968
18	9 32 46.17	2.2997	16 56 36.2	14.136	18	11 18 13.91	2.1202	4 13 48.1	16.987
19	9 35 4.00	2.2947	16 42 25.0	14.236	19	11 20 21.07	2.1184	3 56 48.4	17.004
20	9 37 21.53	2.2897	16 28 7.9	14.334	20	11 22 28.12	2.1167	3 39 47.6	17.022
21	9 39 38.76	2.2846	16 13 44.9	14.431	21	11 24 35.07	2.1150	3 22 45.8	17.037
22	9 41 55.68	2.2796	15 59 16.2	14.526	22	11 26 41.92	2.1134	3 5 43.2	17.049
23	9 44 12.31	2.2747	N. 15 44 41.8	14.619	23	11 28 48.67	2.1118	N. 2 48 39.9	17.061
	WEDNESDAY 14.					**FRIDAY 16.**			
0	9 46 28.64	2.2698	N. 15 30 1.9	14.711	0	11 30 55.33	2.1103	N. 2 31 35.9	17.071
1	9 48 44.68	2.2649	15 15 16.5	14.801	1	11 33 1.91	2.1090	2 14 31.4	17.079
2	9 51 0.43	2.2602	15 0 25.8	14.888	2	11 35 8.41	2.1078	1 57 26.4	17.087
3	9 53 15.90	2.2554	14 45 29.9	14.974	3	11 37 14.84	2.1065	1 40 21.0	17.092
4	9 55 31.08	2.2507	14 30 28.9	15.059	4	11 39 21.19	2.1054	1 23 15.4	17.095
5	9 57 45.98	2.2460	14 15 22.8	15.142	5	11 41 27.49	2.1045	1 6 9.6	17.098
6	10 0 0.60	2.2413	14 0 11.9	15.223	6	11 43 33.73	2.1036	0 49 3.7	17.098
7	10 2 14.94	2.2368	13 44 56.1	15.303	7	11 45 39.92	2.1028	0 31 57.9	17.097
8	10 4 29.02	2.2324	13 29 35.6	15.379	8	11 47 46.06	2.1020	N. 0 14 52.1	17.094
9	10 6 42.83	2.2279	13 14 10.6	15.454	9	11 49 52.16	2.1013	S. 0 2 13.4	17.090
10	10 8 56.37	2.2235	12 58 41.1	15.528	10	11 51 58.22	2.1008	0 19 18.7	17.085
11	10 11 9.65	2.2192	12 43 7.2	15.601	11	11 54 4.26	2.1004	0 36 23.6	17.078
12	10 13 22.67	2.2149	12 27 29.0	15.672	12	11 56 10.27	2.1000	0 53 28.0	17.068
13	10 15 35.44	2.2107	12 11 46.6	15.740	13	11 58 16.26	2.0998	1 10 31.8	17.058
14	10 17 47.95	2.2065	11 56 0.2	15.807	14	12 0 22.24	2.0996	1 27 35.0	17.047
15	10 20 0.22	2.2025	11 40 9.8	15.872	15	12 2 28.21	2.0994	1 44 37.4	17.033
16	10 22 12.25	2.1985	11 24 15.6	15.935	16	12 4 34.17	2.0994	2 1 38.9	17.018
17	10 24 24.04	2.1945	11 8 17.6	15.997	17	12 6 40.14	2.0996	2 18 39.6	17.003
18	10 26 35.59	2.1906	10 52 16.0	16.057	18	12 8 46.12	2.0998	2 35 39.2	16.984
19	10 28 46.91	2.1868	10 36 10.8	16.115	19	12 10 52.11	2.1000	2 52 37.7	16.965
20	10 30 58.01	2.1831	10 20 2.2	16.172	20	12 12 58.12	2.1004	3 9 35.0	16.943
21	10 33 8.88	2.1794	10 3 50.2	16.227	21	12 15 4.16	2.1009	3 26 30.9	16.921
22	10 35 19.54	2.1758	9 47 35.0	16.280	22	12 17 10.23	2.1014	3 43 25.5	16.898
23	10 37 29.98	2.1723	9 31 16.6	16.331	23	12 19 16.33	2.1020	4 0 18.6	16.873
24	10 39 40.21	2.1688	N. 9 14 55.3	16.380	24	12 21 22.47	2.1028	S. 4 17 10.2	16.846

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 17.					MONDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 21 22.47	2.1028	S. 4 17 10.2	16.846	0	14 4 43.87	2.2325	S. 16 46 54.1	13.838
1	12 23 28.66	2.1036	4 34 0.1	16.817	1	14 6 57.95	2.2368	17 0 41.4	13.740
2	12 25 34.90	2.1044	4 50 48.2	16.787	2	14 9 12.29	2.2413	17 14 22.9	13.641
3	12 27 41.19	2.1054	5 7 34.5	16.756	3	14 11 26.90	2.2457	17 27 58.3	13.540
4	12 29 47.55	2.1066	5 24 18.9	16.723	4	14 13 41.77	2.2501	17 41 27.7	13.438
5	12 31 53.98	2.1077	5 41 1.2	16.688	5	14 15 56.91	2.2546	17 54 50.9	13.334
6	12 34 0.47	2.1089	5 57 41.5	16.653	6	14 18 12.32	2.2591	18 8 7.8	13.229
7	12 36 7.05	2.1103	6 14 19.5	16.615	7	14 20 28.00	2.2637	18 21 18.4	13.123
8	12 38 13.71	2.1118	6 30 55.3	16.577	8	14 22 43.96	2.2683	18 34 22.6	13.016
9	12 40 20.46	2.1133	6 47 28.7	16.537	9	14 25 0.19	2.2728	18 47 20.3	12.907
10	12 42 27.30	2.1148	7 3 59.7	16.495	10	14 27 16.70	2.2775	19 0 11.4	12.796
11	12 44 34.24	2.1165	7 20 28.1	16.452	11	14 29 33.49	2.2823	19 12 55.8	12.684
12	12 46 41.28	2.1183	7 36 53.9	16.407	12	14 31 50.57	2.2870	19 25 33.5	12.571
13	12 48 48.43	2.1202	7 53 16.9	16.361	13	14 34 7.93	2.2917	19 38 4.3	12.456
14	12 50 55.70	2.1221	8 9 37.2	16.314	14	14 36 25.57	2.2964	19 50 28.2	12.340
15	12 53 3.08	2.1241	8 25 54.6	16.265	15	14 38 43.50	2.3013	20 2 45.1	12.223
16	12 55 10.59	2.1263	8 42 9.0	16.214	16	14 41 1.72	2.3060	20 14 55.0	12.104
17	12 57 18.23	2.1284	8 58 20.3	16.162	17	14 43 20.22	2.3108	20 26 57.6	11.983
18	12 59 26.00	2.1308	9 14 28.4	16.108	18	14 45 39.02	2.3157	20 38 53.0	11.862
19	13 1 33.92	2.1331	9 30 33.3	16.054	19	14 47 58.10	2.3204	20 50 41.1	11.740
20	13 3 41.97	2.1355	9 46 34.9	15.998	20	14 50 17.47	2.3253	21 2 21.8	11.616
21	13 5 50.18	2.1381	10 2 33.0	15.940	21	14 52 37.13	2.3301	21 13 55.0	11.491
22	13 7 58.54	2.1406	10 18 27.7	15.881	22	14 54 57.08	2.3349	21 25 20.7	11.364
23	13 10 7.05	2.1433	S. 10 34 18.7	15.820	23	14 57 17.32	2.3398	S. 21 36 38.7	11.236
	SUNDAY 18.					TUESDAY 20.			
0	13 12 15.73	2.1460	S. 10 50 6.1	15.758	0	14 59 37.86	2.3447	S. 21 47 49.0	11.107
1	13 14 24.57	2.1488	11 5 49.7	15.694	1	15 1 58.68	2.3494	21 58 51.5	10.976
2	13 16 33.59	2.1518	11 21 29.4	15.629	2	15 4 19.79	2.3543	22 9 46.1	10.843
3	13 18 42.78	2.1548	11 37 5.2	15.563	3	15 6 41.19	2.3591	22 20 32.7	10.710
4	13 20 52.16	2.1578	11 52 37.0	15.495	4	15 9 2.88	2.3638	22 31 11.3	10.576
5	13 23 1.72	2.1609	12 8 4.6	15.425	5	15 11 24.85	2.3686	22 41 41.8	10.441
6	13 25 11.47	2.1641	12 23 28.0	15.355	6	15 13 47.11	2.3734	22 52 4.2	10.304
7	13 27 21.41	2.1673	12 38 47.2	15.283	7	15 16 9.66	2.3782	23 2 18.3	10.165
8	13 29 31.55	2.1707	12 54 2.0	15.209	8	15 18 32.49	2.3828	23 12 24.0	10.026
9	13 31 41.89	2.1741	13 9 12.3	15.134	9	15 20 55.60	2.3875	23 22 21.4	9.885
10	13 33 52.44	2.1776	13 24 18.1	15.058	10	15 23 18.99	2.3922	23 32 10.2	9.743
11	13 36 3.20	2.1811	13 39 19.2	14.980	11	15 25 42.66	2.3968	23 41 50.6	9.601
12	13 38 14.17	2.1847	13 54 15.7	14.901	12	15 28 6.61	2.4014	23 51 22.3	9.456
13	13 40 25.36	2.1883	14 9 7.3	14.820	13	15 30 30.83	2.4059	24 0 45.3	9.311
14	13 42 36.77	2.1921	14 23 54.1	14.738	14	15 32 55.32	2.4104	24 9 59.6	9.164
15	13 44 48.41	2.1959	14 38 35.9	14.654	15	15 35 20.08	2.4149	24 19 5.0	9.016
16	13 47 0.28	2.1998	14 53 12.6	14.569	16	15 37 45.11	2.4193	24 28 1.5	8.868
17	13 49 12.38	2.2036	15 7 44.2	14.483	17	15 40 10.39	2.4236	24 36 49.1	8.718
18	13 51 24.71	2.2076	15 22 10.6	14.395	18	15 42 35.94	2.4280	24 45 27.7	8.568
19	13 53 37.29	2.2117	15 36 31.6	14.305	19	15 45 1.75	2.4323	24 53 57.2	8.415
20	13 55 50.11	2.2157	15 50 47.2	14.215	20	15 47 27.81	2.4364	25 2 17.5	8.262
21	13 58 3.17	2.2198	16 4 57.4	14.123	21	15 49 54.12	2.4405	25 10 28.6	8.108
22	14 0 16.48	2.2240	16 19 2.0	14.029	22	15 52 20.67	2.4445	25 18 30.4	7.953
23	14 2 30.05	2.2283	16 33 0.9	13.934	23	15 54 47.46	2.4485	25 26 22.9	7.797
24	14 4 43.87	2.2325	S. 16 46 54.1	13.838	24	15 57 14.49	2.4524	S. 25 34 6.0	7.639

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.			Diff. for 1 Min.
	h	m	s	s	°	′	″	″
0	15	57	14.49	2.4524	S. 25	34	6.0	7.639
1	15	59	41.75	2.4563	25	41	39.6	7.481
2	16	2	9.25	2.4602	25	49	3.7	7.323
3	16	4	36.97	2.4638	25	56	18.3	7.163
4	16	7	4.91	2.4674	26	3	23.2	7.002
5	16	9	33.06	2.4709	26	10	18.5	6.840
6	16	12	1.42	2.4743	26	17	4.0	6.678
7	16	14	29.98	2.4777	26	23	39.8	6.514
8	16	16	58.74	2.4809	26	30	5.7	6.350
9	16	19	27.69	2.4841	26	36	21.8	6.185
10	16	21	56.83	2.4872	26	42	27.9	6.019
11	16	24	26.15	2.4902	26	48	24.1	5.853
12	16	26	55.65	2.4931	26	54	10.3	5.686
13	16	29	25.32	2.4958	26	59	46.4	5.518
14	16	31	55.14	2.4983	27	5	12.4	5.349
15	16	34	25.12	2.5009	27	10	28.3	5.180
16	16	36	55.25	2.5034	27	15	34.0	5.010
17	16	39	25.52	2.5056	27	20	29.5	4.840
18	16	41	55.92	2.5078	27	25	14.8	4.669
19	16	44	26.45	2.5098	27	29	49.8	4.498
20	16	46	57.10	2.5118	27	34	14.6	4.327
21	16	49	27.87	2.5137	27	38	29.0	4.153
22	16	51	58.74	2.5153	27	42	33.0	3.981
23	16	54	29.71	2.5169	S. 27	46	26.7	3.808

THURSDAY 22.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.			Diff. for 1 Min.
	h	m	s	s	°	′	″	″
0	16	57	0.77	2.5183	S. 27	50	10.0	3.634
1	16	59	31.91	2.5197	27	53	42.8	3.460
2	17	2	3.13	2.5208	27	57	5.2	3.287
3	17	4	34.41	2.5218	28	0	17.2	3.112
4	17	7	5.75	2.5228	28	3	18.6	2.937
5	17	9	37.14	2.5235	28	6	9.6	2.762
6	17	12	8.57	2.5242	28	8	50.0	2.587
7	17	14	40.04	2.5248	28	11	20.0	2.412
8	17	17	11.54	2.5251	28	13	39.4	2.237
9	17	19	43.05	2.5253	28	15	48.4	2.062
10	17	22	14.57	2.5253	28	17	46.8	1.885
11	17	24	46.09	2.5253	28	19	34.6	1.709
12	17	27	17.61	2.5252	28	21	11.9	1.534
13	17	29	49.11	2.5248	28	22	38.7	1.358
14	17	32	20.58	2.5243	28	23	54.9	1.183
15	17	34	52.02	2.5237	28	25	0.6	1.008
16	17	37	23.42	2.5228	28	25	55.8	0.833
17	17	39	54.76	2.5219	28	26	40.5	0.658
18	17	42	26.05	2.5209	28	27	14.7	0.483
19	17	44	57.27	2.5198	28	27	38.4	0.308
20	17	47	28.42	2.5184	28	27	51.6	−0.133
21	17	49	59.48	2.5169	28	27	54.4	+0.041
22	17	52	30.45	2.5153	28	27	46.7	0.215
23	17	55	1.31	2.5135	28	27	28.6	0.388
24	17	57	32.07	2.5117	S. 28	27	0.1	0.562

FRIDAY 23.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.			Diff. for 1 Min.
	h	m	s	s	°	′	″	″
0	17	57	32.07	2.5117	S. 28	27	0.1	0.562
1	18	0	2.71	2.5096	28	26	21.2	0.734
2	18	2	33.22	2.5073	28	25	32.0	0.906
3	18	5	3.59	2.5050	28	24	32.5	1.078
4	18	7	33.82	2.5025	28	23	22.7	1.249
5	18	10	3.89	2.4999	28	22	2.6	1.420
6	18	12	33.81	2.4972	28	20	32.3	1.590
7	18	15	3.56	2.4943	28	18	51.8	1.759
8	18	17	33.13	2.4913	28	17	1.2	1.928
9	18	20	2.52	2.4883	28	15	0.4	2.097
10	18	22	31.72	2.4850	28	12	49.6	2.264
11	18	25	0.72	2.4817	28	10	28.7	2.432
12	18	27	29.52	2.4782	28	7	57.8	2.598
13	18	29	58.10	2.4744	28	5	17.0	2.763
14	18	32	26.45	2.4707	28	2	26.3	2.928
15	18	34	54.58	2.4668	27	59	25.7	3.091
16	18	37	22.47	2.4628	27	56	15.4	3.253
17	18	39	50.11	2.4587	27	52	55.3	3.416
18	18	42	17.51	2.4545	27	49	25.5	3.578
19	18	44	44.65	2.4501	27	45	46.0	3.738
20	18	47	11.52	2.4457	27	41	56.9	3.897
21	18	49	38.13	2.4412	27	37	58.4	4.055
22	18	52	4.46	2.4365	27	33	50.3	4.213
23	18	54	30.51	2.4318	S. 27	29	32.8	4.369

SATURDAY 24.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.			Diff. for 1 Min.
	h	m	s	s	°	′	″	″
0	18	56	56.27	2.4268	S. 27	25	6.0	4.524
1	18	59	21.73	2.4218	27	20	29.9	4.678
2	19	1	46.89	2.4168	27	15	44.6	4.832
3	19	4	11.75	2.4117	27	10	50.1	4.984
4	19	6	36.29	2.4064	27	5	46.5	5.136
5	19	9	0.52	2.4011	27	0	33.8	5.286
6	19	11	24.42	2.3957	26	55	12.2	5.434
7	19	13	48.00	2.3902	26	49	41.7	5.582
8	19	16	11.24	2.3846	26	44	2.4	5.729
9	19	18	34.15	2.3790	26	38	14.2	5.875
10	19	20	56.72	2.3733	26	32	17.4	6.018
11	19	23	18.94	2.3674	26	26	12.0	6.162
12	19	25	40.81	2.3615	26	19	58.0	6.303
13	19	28	2.32	2.3556	26	13	35.6	6.443
14	19	30	23.48	2.3497	26	7	4.8	6.583
15	19	32	44.28	2.3436	26	0	25.7	6.721
16	19	35	4.71	2.3374	25	53	38.3	6.857
17	19	37	24.77	2.3313	25	46	42.8	6.993
18	19	39	44.46	2.3251	25	39	39.2	7.127
19	19	42	3.78	2.3188	25	32	27.6	7.260
20	19	44	22.72	2.3125	25	25	8.0	7.392
21	19	46	41.28	2.3062	25	17	40.6	7.522
22	19	48	59.46	2.2998	25	10	5.4	7.651
23	19	51	17.25	2.2933	25	2	22.5	7.778
24	19	53	34.65	2.2868	S. 24	54	32.0	7.904

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
			SUNDAY 25.					TUESDAY 27.	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 53 34.65	2.2868	S. 24 54 32.0	7.904	0	21 35 46.09	1.9783	S. 16 35 45.6	12.362
1	19 55 51.66	2.2803	24 46 34.0	8.029	1	21 37 44.62	1.9728	16 23 22.1	12.423
2	19 58 8.28	2.2738	24 38 28.5	8.153	2	21 39 42.82	1.9672	16 10 54.9	12.483
3	20 0 24.51	2.2672	24 30 15.7	8.274	3	21 41 40.68	1.9617	15 58 24.2	12.541
4	20 2 40.34	2.2606	24 21 55.6	8.396	4	21 43 38.22	1.9563	15 45 50.0	12.598
5	20 4 55.78	2.2540	24 13 28.2	8.515	5	21 45 35.43	1.9508	15 33 12.4	12.654
6	20 7 10.82	2.2473	24 4 53.8	8.633	6	21 47 32.31	1.9453	15 20 31.5	12.709
7	20 9 25.46	2.2407	23 56 12.3	8.749	7	21 49 28.87	1.9401	15 7 47.3	12.763
8	20 11 39.70	2.2340	23 47 23.9	8.864	8	21 51 25.12	1.9349	14 54 59.8	12.815
9	20 13 53.54	2.2273	23 38 28.6	8.978	9	21 53 21.06	1.9298	14 42 9.3	12.868
10	20 16 6.98	2.2207	23 29 26.5	9.091	10	21 55 16.69	1.9246	14 29 15.7	12.918
11	20 18 20.02	2.2139	23 20 17.7	9.203	11	21 57 12.01	1.9195	14 16 19.1	12.968
12	20 20 32.65	2.2072	23 11 2.2	9.313	12	21 59 7.03	1.9145	14 3 19.5	13.017
13	20 22 44.88	2.2005	23 1 40.2	9.420	13	22 1 1.75	1.9096	13 50 17.1	13.063
14	20 24 56.71	2.1938	22 52 11.8	9.527	14	22 2 56.18	1.9048	13 37 11.9	13.110
15	20 27 8.14	2.1871	22 42 37.0	9.633	15	22 4 50.32	1.9000	13 24 3.9	13.156
16	20 29 19.16	2.1803	22 32 55.9	9.737	16	22 6 44.18	1.8953	13 10 53.2	13.199
17	20 31 29.78	2.1737	22 23 8.6	9.839	17	22 8 37.75	1.8906	12 57 40.0	13.242
18	20 33 40.00	2.1670	22 13 15.2	9.941	18	22 10 31.05	1.8860	12 44 24.2	13.284
19	20 35 49.82	2.1603	22 3 15.7	10.042	19	22 12 24.07	1.8814	12 31 5.9	13.325
20	20 37 59.24	2.1536	21 53 10.2	10.140	20	22 14 16.82	1.8769	12 17 45.2	13.365
21	20 40 8.25	2.1469	21 42 58.9	10.237	21	22 16 9.30	1.8725	12 4 22.1	13.404
22	20 42 16.87	2.1403	21 32 41.8	10.333	22	22 18 1.52	1.8682	11 50 56.7	13.442
23	20 44 25.09	2.1337	S. 21 22 18.9	10.428	23	22 19 53.48	1.8639	S. 11 37 29.1	13.478
			MONDAY 26.					WEDNESDAY 28.	
0	20 46 32.91	2.1271	S. 21 11 50.4	10.521	0	22 21 45.19	1.8598	S. 11 23 59.3	13.514
1	20 48 40.34	2.1205	21 1 16.4	10.613	1	22 23 36.65	1.8556	11 10 27.4	13.549
2	20 50 47.37	2.1138	20 50 36.9	10.703	2	22 25 27.86	1.8515	10 56 53.4	13.583
3	20 52 54.00	2.1073	20 39 52.0	10.793	3	22 27 18.83	1.8475	10 43 17.4	13.616
4	20 55 0.25	2.1009	20 29 1.8	10.880	4	22 29 9.56	1.8436	10 29 39.5	13.647
5	20 57 6.11	2.0944	20 18 6.4	10.966	5	22 31 0.06	1.8398	10 15 59.8	13.678
6	20 59 11.58	2.0879	20 7 5.9	11.051	6	22 32 50.33	1.8359	10 2 18.2	13.708
7	21 1 16.66	2.0814	19 56 0.3	11.135	7	22 34 40.37	1.8323	9 48 34.8	13.738
8	21 3 21.35	2.0751	19 44 49.7	11.218	8	22 36 30.20	1.8286	9 34 49.7	13.766
9	21 5 25.67	2.0688	19 33 34.2	11.299	9	22 38 19.80	1.8249	9 21 2.9	13.793
10	21 7 29.60	2.0624	19 22 13.8	11.379	10	22 40 9.19	1.8215	9 7 14.6	13.818
11	21 9 33.16	2.0562	19 10 48.7	11.457	11	22 41 58.38	1.8181	8 53 24.7	13.844
12	21 11 36.34	2.0498	18 59 19.0	11.534	12	22 43 47.36	1.8147	8 39 33.3	13.868
13	21 13 39.14	2.0437	18 47 44.6	11.610	13	22 45 36.14	1.8113	8 25 40.5	13.892
14	21 15 41.58	2.0375	18 36 5.8	11.684	14	22 47 24.72	1.8082	8 11 46.3	13.914
15	21 17 43.64	2.0313	18 24 22.5	11.758	15	22 49 13.12	1.8050	7 57 50.8	13.936
16	21 19 45.34	2.0253	18 12 34.8	11.830	16	22 51 1.32	1.8018	7 43 54.0	13.957
17	21 21 46.68	2.0193	18 0 42.9	11.901	17	22 52 49.34	1.7989	7 29 56.0	13.977
18	21 23 47.65	2.0133	17 48 46.7	11.970	18	22 54 37.19	1.7960	7 15 56.8	13.996
19	21 25 48.27	2.0073	17 36 46.5	12.038	19	22 56 24.86	1.7931	7 1 56.5	14.014
20	21 27 48.53	2.0014	17 24 42.1	12.106	20	22 58 12.36	1.7903	6 47 55.1	14.032
21	21 29 48.44	1.9956	17 12 33.8	12.171	21	22 59 59.70	1.7876	6 33 52.7	14.048
22	21 31 48.00	1.9898	17 0 21.6	12.236	22	23 1 46.87	1.7849	6 19 49.3	14.064
23	21 33 47.22	1.9841	16 48 5.5	12.300	23	23 3 33.89	1.7824	6 5 45.0	14.079
24	21 35 46.09	1.9783	S. 16 35 45.6	12.362	24	23 5 20.76	1.7799	S. 5 51 39.8	14.093

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 29.			
	h m s	s	° ′ ″	″
0	23 5 20.76	1.7799	S. 5 51 39.8	14.093
1	23 7 7.48	1.7775	5 37 33.8	14.107
2	23 8 54.06	1.7752	5 23 27.0	14.119
3	23 10 40.50	1.7728	5 9 19.5	14.131
4	23 12 26.80	1.7706	4 55 11.3	14.142
5	23 14 12.97	1.7685	4 41 2.5	14.152
6	23 15 59.02	1.7665	4 26 53.1	14.161
7	23 17 44.95	1.7645	4 12 43.2	14.170
8	23 19 30.76	1.7626	3 58 32.7	14.178
9	23 21 16.46	1.7608	3 44 21.8	14.185
10	23 23 2.05	1.7589	3 30 10.5	14.191
11	23 24 47.53	1.7573	3 15 58.9	14.196
12	23 26 32.92	1.7557	3 1 47.0	14.201
13	23 28 18.21	1.7541	2 47 34.8	14.205
14	23 30 3.41	1.7527	2 33 22.4	14.208
15	23 31 48.53	1.7513	2 19 9.8	14.211
16	23 33 33.57	1.7499	2 4 57.1	14.213
17	23 35 18.52	1.7487	1 50 44.3	14.213
18	23 37 3.41	1.7476	1 36 31.5	14.213
19	23 38 48.23	1.7464	1 22 18.7	14.213
20	23 40 32.98	1.7454	1 8 5.9	14.213
21	23 42 17.68	1.7445	0 53 53.2	14.211
22	23 44 2.32	1.7436	0 39 40.6	14.208
23	23 45 46.91	1.7428	S. 0 25 28.3	14.204
	FRIDAY 30.			
0	23 47 31.46	1.7421	S. 0 11 16.1	14.201
1	23 49 15.96	1.7414	N. 0 2 55.8	14.196
2	23 51 0.43	1.7409	0 17 7.4	14.191
3	23 52 44.87	1.7404	0 31 18.7	14.185
4	23 54 29.28	1.7399	0 45 29.6	14.178
5	23 56 13.66	1.7396	0 59 40.1	14.171
6	23 57 58.03	1.7393	1 13 50.1	14.163
7	23 59 42.38	1.7391	1 27 59.6	14.154
8	0 1 26.72	1.7390	1 42 8.6	14.144
9	0 3 11.06	1.7390	1 56 16.9	14.133
10	0 4 55.40	1.7390	2 10 24.6	14.123
11	0 6 39.74	1.7391	2 24 31.7	14.112
12	0 8 24.09	1.7393	2 38 38.0	14.099
13	0 10 8.45	1.7395	2 52 43.6	14.087
14	0 11 52.83	1.7398	3 6 48.4	14.073
15	0 13 37.22	1.7402	3 20 52.3	14.058
16	0 15 21.65	1.7407	3 34 55.4	14.043
17	0 17 6.10	1.7412	3 48 57.5	14.028
18	0 18 50.59	1.7418	4 2 58.7	14.012
19	0 20 35.12	1.7426	4 16 58.9	13.995
20	0 22 19.70	1.7433	4 30 58.1	13.977
21	0 24 4.32	1.7442	4 44 56.1	13.958
22	0 25 49.00	1.7451	4 58 53.1	13.940
23	0 27 33.73	1.7461	5 12 48.9	13.920
24	0 29 18.53	1.7472	N. 5 26 43.5	13.900

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 31.			
	h m s	s	° ′ ″	″
0	0 29 18.53	1.7472	N. 5 26 43.5	13.900
1	0 31 3.39	1.7483	5 40 36.9	13.879
2	0 32 48.32	1.7495	5 54 29.0	13.857
3	0 34 33.33	1.7508	6 8 19.7	13.834
4	0 36 18.42	1.7522	6 22 9.1	13.812
5	0 38 3.59	1.7536	6 35 57.1	13.788
6	0 39 48.85	1.7551	6 49 43.7	13.763
7	0 41 34.20	1.7568	7 3 28.7	13.738
8	0 43 19.66	1.7584	7 17 12.3	13.713
9	0 45 5.21	1.7601	7 30 54.3	13.687
10	0 46 50.87	1.7619	7 44 34.7	13.660
11	0 48 36.64	1.7638	7 58 13.5	13.633
12	0 50 22.53	1.7658	8 11 50.6	13.603
13	0 52 8.53	1.7678	8 25 25.9	13.574
14	0 53 54.66	1.7699	8 38 59.5	13.545
15	0 55 40.92	1.7721	8 52 31.3	13.514
16	0 57 27.31	1.7743	9 6 1.2	13.483
17	0 59 13.84	1.7767	9 19 29.3	13.452
18	1 1 0.51	1.7791	9 32 55.4	13.418
19	1 2 47.33	1.7816	9 46 19.5	13.385
20	1 4 34.30	1.7842	9 59 41.6	13.351
21	1 6 21.43	1.7868	10 13 1.6	13.317
22	1 8 8.71	1.7894	10 26 19.6	13.282
23	1 9 56.16	1.7922	N. 10 39 35.4	13.245
	SUNDAY, FEBRUARY 1.			
0	1 11 43.78	1.7951	N. 10 52 49.0	13.208

PHASES OF THE MOON.

			d	h	m
☽	First Quarter	Jan.	4	1	9.1
○	Full Moon		11	17	9.0
☾	Last Quarter		18	12	29.8
●	New Moon		25	18	34.1

			d	h
☾	Apogee	Jan.	3	8.6
☾	Perigee		15	6.2
☾	Apogee		31	5.5

FEBRUARY, 1914.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	20 57 7.89	10.209	S. 17 15 13.8	+42.31	16 15.66	68.30	13 42.16	0.352
Mon.	2	21 1 12.49	10.174	16 58 9.3	43.06	16 15.52	68.19	13 50.18	0.317
Tues.	3	21 5 16.26	10.139	16 40 47.0	43.79	16 15.37	68.08	13 57.37	0.282
Wed.	4	21 9 19.19	10.104	16 23 7.4	+44.50	16 15.22	67.97	14 3.73	0.248
Thur.	5	21 13 21.29	10.070	16 5 11.0	45.19	16 15.07	67.85	14 9.26	0.213
Frid.	6	21 17 22.55	10.035	15 46 58.1	45.87	16 14.91	67.74	14 13.95	0.179
Sat.	7	21 21 22.98	10.001	15 28 29.1	+46.54	16 14.75	67.62	14 17.81	0.145
SUN.	8	21 25 22.60	9.967	15 9 44.4	47.18	16 14.58	67.50	14 20.87	0.111
Mon.	9	21 29 21.41	9.934	14 50 44.5	47.80	16 14.41	67.38	14 23.12	0.077
Tues.	10	21 33 19.42	9.901	14 31 29.7	+48.41	16 14.23	67.27	14 24.57	0.044
Wed.	11	21 37 16.65	9.868	14 12 0.4	49.01	16 14.04	67.16	14 25.24	0.012
Thur.	12	21 41 13.10	9.836	13 52 17.0	49.60	16 13.85	67.05	14 25.14	0.020
Frid.	13	21 45 8.80	9.805	13 32 19.9	+50.16	16 13.66	66.95	14 24.28	0.051
Sat.	14	21 49 3.75	9.774	13 12 9.4	50.70	16 13.46	66.84	14 22.68	0.082
SUN.	15	21 52 57.97	9.744	12 51 46.0	51.23	16 13.26	66.74	14 20.35	0.112
Mon.	16	21 56 51.48	9.715	12 31 10.0	+51.75	16 13.06	66.63	14 17.31	0.141
Tues.	17	22 0 44.29	9.686	12 10 21.8	52.25	16 12.85	66.53	14 13.57	0.170
Wed.	18	22 4 36.40	9.657	11 49 22.0	52.73	16 12.64	66.43	14 9.14	0.198
Thur.	19	22 8 27.83	9.629	11 28 10.8	+53.19	16 12.42	66.33	14 4.04	0.226
Frid.	20	22 12 18.59	9.602	11 6 48.6	53.64	16 12.20	66 23	13 58.27	0.254
Sat.	21	22 16 8.70	9.575	10 45 16.0	54.07	16 11.98	66.13	13 51.84	0.281
SUN.	22	22 19 58.17	9.548	10 23 33.4	+54.48	16 11.76	66.04	13 44.76	0.307
Mon.	23	22 23 47.01	9.522	10 1 41.2	54.87	16 11.53	65.95	13 37.06	0.333
Tues.	24	22 27 35.23	9.497	9 39 39.7	55.25	16 11.30	65.86	13 28.75	0.359
Wed.	25	22 31 22.84	9.472	9 17 29.4	+55.61	16 11.07	65.77	13 19.83	0.384
Thur.	26	22 35 9.86	9.447	8 55 10.9	55.94	16 10.84	65.69	13 10.32	0.408
Frid.	27	22 38 56.30	9.423	8 32 44.5	56.25	16 10.60	65.61	13 0.24	0.432
Sat.	28	22 42 42.18	9.400	8 10 10.5	56.56	16 10.37	65.53	12 49.59	0.455
SUN.	29	22 46 27.50	9.377	S. 7 47 29.5	+56.85	16 10.13	65.45	12 38.39	0.477

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0ˢ.18 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	20 57 5.56	10.209	S. 17 15 23.4	+42.30	13 42.08	0.352	20 43 23.48
Mon.	2	21 1 10.15	10.174	16 58 19.2	43.05	13 50.11	0.317	20 47 20.04
Tues.	3	21 5 13.91	10.139	16 40 57.2	43.78	13 57.31	0.282	20 51 16.60
Wed.	4	21 9 16.83	10.104	16 23 17.9	+44.49	14 3.68	0.248	20 55 13.15
Thur.	5	21 13 18.92	10.070	16 5 21.7	45.18	14 9.21	0.213	20 59 9.71
Frid.	6	21 17 20.18	10.035	15 47 9.0	45.86	14 13.91	0.179	21 3 6.27
Sat.	7	21 21 20.61	10.001	15 28 40.2	+46.53	14 17.78	0.145	21 7 2.82
SUN.	8	21 25 20.22	9.967	15 9 55.7	47.18	14 20.84	0.111	21 10 59.38
Mon.	9	21 29 19.03	9.934	14 50 55.9	47.80	14 23.10	0.077	21 14 55.93
Tues.	10	21 33 17.05	9.901	14 31 41.3	+48.41	14 24.56	0.044	21 18 52.49
Wed.	11	21 37 14.28	9.869	14 12 12.2	49.01	14 25.23	0.012	21 22 49.05
Thur.	12	21 41 10.74	9.837	13 52 28.9	49.59	14 25.14	0.020	21 26 45.60
Frid.	13	21 45 6.44	9.806	13 32 31.9	+50.15	14 24.29	0.051	21 30 42.16
Sat.	14	21 49 1.40	9.775	13 12 21.5	50.70	14 22.70	0.082	21 34 38.71
SUN.	15	21 52 55.64	9.745	12 51 58.2	51.23	14 20.38	0.112	21 38 35.27
Mon.	16	21 56 49.17	9.716	12 31 22.3	+51.75	14 17.34	0.141	21 42 31.82
Tues.	17	22 0 41.99	9.687	12 10 34.2	52.25	14 13.61	0.170	21 46 28.38
Wed.	18	22 4 34.12	9.658	11 49 34.4	52.73	14 9.19	0.198	21 50 24.93
Thur.	19	22 8 25.57	9.630	11 28 23.2	+53.19	14 4.09	0.226	21 54 21.49
Frid.	20	22 12 16.36	9.603	11 7 1.1	53.64	13 58.32	0.254	21 58 18.04
Sat.	21	22 16 6.50	9.576	10 45 28.5	54.07	13 51.90	0.281	22 2 14.60
SUN.	22	22 19 55.99	9.549	10 23 45.9	+54.48	13 44.83	0.307	22 6 11.15
Mon.	23	22 23 44.85	9.523	10 1 53.6	54.87	13 37.14	0.333	22 10 7.71
Tues.	24	22 27 33.09	9.498	9 39 52.1	55.25	13 28.83	0.359	22 14 4.26
Wed.	25	22 31 20.73	9.473	9 17 41.8	+55.61	13 19.92	0.384	22 18 0.82
Thur.	26	22 35 7.78	9.449	8 55 23.2	55.94	13 10.41	0.408	22 21 57.37
Frid.	27	22 38 54.25	9.425	8 32 56.7	56.26	13 0.33	0.432	22 25 53.93
Sat.	28	22 42 40.16	9.402	8 10 22.6	56.57	12 49.68	0.455	22 29 50.48
SUN.	29	22 46 25.52	9.379	S. 7 47 41.5	+56.85	12 38.49	0.477	22 33 47.04

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,
$+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	Diff. for 1 Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	32	311 48 55.2	48 45.7	152.23	+0.46	9.993 6512	+25.7	3 16 4.31
2	33	312 49 48.2	49 38.5	152.18	0.56	9.993 7138	26.4	3 12 8.40
3	34	313 50 39.8	50 29.9	152.12	0.64	9.993 7782	27.2	3 8 12.49
4	35	314 51 29.9	51 20.0	152.06	+0.68	9.993 8444	+28.0	3 4 16.57
5	36	315 52 18.7	52 8.5	152.00	0.71	9.993 9126	28.8	3 0 20.66
6	37	316 53 5.9	52 55.6	151.94	0.70	9.993 9829	29.7	2 56 24.75
7	38	317 53 51.7	53 41.3	151.88	+0.66	9.994 0554	+30.7	2 52 28.84
8	39	318 54 36.0	54 25.4	151.82	0.60	9.994 1302	31.6	2 48 32.93
9	40	319 55 18.9	55 8.1	151.76	0.50	9.994 2072	32.6	2 44 37.02
10	41	320 56 0.3	55 49.4	151.70	+0.38	9.994 2866	+33.6	2 40 41.11
11	42	321 56 40.4	56 29.3	151.64	0.26	9.994 3685	34.5	2 36 45.20
12	43	322 57 19.1	57 7.9	151.58	+0.12	9.994 4527	35.5	2 32 49.29
13	44	323 57 56.6	57 45.2	151.53	−0.03	9.994 5392	+36.5	2 28 53.38
14	45	324 58 32.8	58 21.3	151.48	0.15	9.994 6278	37.4	2 24 57.47
15	46	325 59 7.8	58 56.2	151.43	0.26	9.994 7184	38.2	2 21 1.57
16	47	326 59 41.6	59 29.9	151.38	−0.34	9.994 8109	+38.9	2 17 5.66
17	48	328 0 14.2	0 2.4	151.33	0.41	9.994 9051	39.5	2 13 9.75
18	49	329 0 45.6	0 33.6	151.28	0.44	9.995 0008	40.1	2 9 13.84
19	50	330 1 15.8	1 3.6	151.23	−0.43	9.995 0978	+40.7	2 5 17.93
20	51	331 1 44.6	1 32.3	151.17	0.39	9.995 1960	41.2	2 1 22.02
21	52	332 2 12.0	1 59.6	151.11	0.33	9.995 2953	41.6	1 57 26.11
22	53	333 2 37.9	2 25.4	151.05	−0.25	9.995 3955	+42.0	1 53 30.20
23	54	334 3 2.3	2 49.7	150.98	0.13	9.995 4965	42.3	1 49 34.29
24	55	335 3 25.2	3 12.4	150.91	−0.01	9.995 5983	42.6	1 45 38.38
25	56	336 3 46.3	3 33.4	150.84	+0.11	9.995 7009	+42.9	1 41 42.48
26	57	337 4 5.7	3 52.7	150.77	0.25	9.995 8042	43.2	1 37 46.57
27	58	338 4 23.3	4 10.2	150.69	0.37	9.995 9082	43.5	1 33 50.66
28	59	339 4 39.0	4 25.8	150.61	0.48	9.996 0128	43.8	1 29 54.75
29	60	340 4 52.8	4 39.4	150.53	+0.59	9.996 1182	+44.1	1 25 58.84

Note.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour, $-9^{s}.8296$. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 47.4	14 48.8	54 10.92	+0.316	54 15.98	+0.528	4 35.9	1.69	6.2
2	14 50.8	14 53.6	54 23.62	0.744	54 33.85	0.961	5 17.6	1.80	7.2
3	14 57.1	15 1.3	54 46.67	1.174	55 2.01	1.381	6 2.5	1.95	8.2
4	15 6.2	15 11.6	55 19.78	+1.578	55 39.81	+1.758	6 51.4	2.13	9.2
5	15 17.6	15 24.1	56 1.88	1.917	56 25.72	2.050	7 44.5	2.30	10.2
6	15 31.0	15 38.2	56 50.96	2.151	57 17.19	2.215	8 41.5	2.43	11.2
7	15 45.4	15 52.7	57 43.94	+2.236	58 10.66	+2.210	9 40.7	2.48	12.2
8	15 59.8	16 6.6	58 36.77	2.133	59 1.65	2.005	10 40.0	2.44	13.2
9	16 12.9	16 18.5	59 24.70	1.828	59 45.33	1.602	11 37.5	2.34	14.2
10	16 23.3	16 27.2	60 2.99	+1.335	60 17.24	+1.035	12 32.3	2.22	15.2
11	16 30.1	16 31.9	60 27.74	0.712	60 34.28	+0.377	13 24.4	2.13	16.2
12	16 32.5	16 32.1	60 36.78	+0.041	60 35.32	−0.281	14 14.9	2.08	17.2
13	16 30.7	16 28.4	60 30.12	−0.581	60 21.49	−0.851	15 4.8	2.09	18.2
14	16 25.2	16 21.3	60 9.83	1.084	59 55.62	1.277	15 55.5	2.15	19.2
15	16 16.9	16 12.0	59 39.34	1.430	59 21.47	1.542	16 48.1	2.24	20.2
16	16 6.8	16 1.5	59 2.49	−1.615	58 42.84	−1.654	17 43.2	2.35	21.2
17	15 56.1	15 50.6	58 22.90	1.665	58 2.98	1.652	18 40.6	2.42	22.2
18	15 45.3	15 40.0	57 43.33	1.620	57 24.16	1.573	19 39.0	2.43	23.2
19	15 35.0	15 30.1	57 5.61	−1.516	56 47.79	−1.453	20 36.6	2.36	24.2
20	15 25.5	15 21.1	56 30.75	1.386	56 14.53	1.317	21 31.7	2.22	25.2
21	15 16.9	15 12.9	55 59.13	1.249	55 44.55	1.181	22 23.0	2.06	26.2
22	15 9.2	15 5.6	55 30.79	−1.113	55 17.84	−1.045	23 10.3	1.90	27.2
23	15 2.3	14 59.2	55 5.70	0.977	54 54.39	0.907	23 54.2	1.77	28.2
24	14 56.4	14 53.8	54 43.94	0.834	54 34.39	0.756	δ	. .	29.2
25	14 51.4	14 49.4	54 25.81	−0.672	54 18.29	−0.580	0 35.4	1.68	0.5
26	14 47.7	14 46.3	54 11.93	0.478	54 6.85	0.367	1 14.9	1.63	1.5
27	14 45.3	14 44.7	54 3.16	−0.245	54 1.01	−0.111	1 53.8	1.62	2.5
28	14 44.6	14 44.9	54 0.54	+0.035	54 1.90	+0.193	2 33.1	1.66	3.5
29	14 45.8	14 47.3	54 5.22	+0.362	54 10.62	+0.540	3 13.9	1.74	4.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 1.					TUESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 11 43.78	1.7951	N. 10 52 49.0	13.208	0	2 42 31.16	2.0132	N. 20 29 13.1	10.472
1	1 13 31.57	1.7980	11 6 0.3	13.170	1	2 44 32.13	2.0193	20 39 39.0	10.392
2	1 15 19.54	1.8010	11 19 9.4	13.133	2	2 46 33.47	2.0254	20 50 0.1	10.311
3	1 17 7.69	1.8041	11 32 16.2	13.093	3	2 48 35.18	2.0316	21 0 16.3	10.228
4	1 18 56.03	1.8073	11 45 20.6	13.053	4	2 50 37.26	2.0378	21 10 27.5	10.146
5	1 20 44.56	1.8104	11 58 22.6	13.013	5	2 52 39.71	2.0440	21 20 33.8	10.062
6	1 22 33.28	1.8137	12 11 22.1	12.971	6	2 54 42.54	2.0503	21 30 34.9	9.976
7	1 24 22.20	1.8171	12 24 19.1	12.929	7	2 56 45.75	2.0566	21 40 30.9	9.889
8	1 26 11.33	1.8205	12 37 13.6	12.887	8	2 58 49.33	2.0629	21 50 21.6	9.801
9	1 28 0.66	1.8240	12 50 5.5	12.843	9	3 0 53.30	2.0694	22 0 7.0	9.713
10	1 29 50.21	1.8276	13 2 54.7	12.798	10	3 2 57.66	2.0758	22 9 47.1	9.623
11	1 31 39.97	1.8313	13 15 41.3	12.753	11	3 5 2.40	2.0823	22 19 21.8	9.532
12	1 33 29.96	1.8350	13 28 25.1	12.707	12	3 7 7.54	2.0888	22 28 50.9	9.439
13	1 35 20.17	1.8388	13 41 6.1	12.660	13	3 9 13.06	2.0953	22 38 14.5	9.346
14	1 37 10.61	1.8426	13 53 44.3	12.613	14	3 11 18.98	2.1020	22 47 32.4	9.251
15	1 39 1.28	1.8465	14 6 19.6	12.564	15	3 13 25.30	2.1087	22 56 44.6	9.156
16	1 40 52.19	1.8505	14 18 52.0	12.515	16	3 15 32.02	2.1153	23 5 51.1	9.059
17	1 42 43.34	1.8546	14 31 21.4	12.466	17	3 17 39.13	2.1219	23 14 51.7	8.961
18	1 44 34.74	1.8588	14 43 47.9	12.415	18	3 19 46.65	2.1287	23 23 46.4	8.861
19	1 46 26.39	1.8630	14 56 11.2	12.363	19	3 21 54.57	2.1353	23 32 35.0	8.760
20	1 48 18.30	1.8673	15 8 31.4	12.310	20	3 24 2.89	2.1421	23 41 17.6	8.659
21	1 50 10.46	1.8716	15 20 48.4	12.257	21	3 26 11.62	2.1488	23 49 54.1	8.556
22	1 52 2.89	1.8760	15 33 2.2	12.203	22	3 28 20.75	2.1556	23 58 24.3	8.452
23	1 53 55.58	1.8805	N. 15 45 12.8	12.148	23	3 30 30.29	2.1624	N. 24 6 48.3	8.347
	MONDAY 2.					WEDNESDAY 4.			
0	1 55 48.55	1.8851	N. 15 57 20.0	12.092	0	3 32 40.24	2.1693	N. 24 15 5.9	8.239
1	1 57 41.79	1.8897	16 9 23.8	12.035	1	3 34 50.60	2.1761	24 23 17.0	8.132
2	1 59 35.31	1.8944	16 21 24.2	11.978	2	3 37 1.37	2.1829	24 31 21.7	8.023
3	2 1 29.12	1.8992	16 33 21.1	11.919	3	3 39 12.55	2.1898	24 39 19.7	7.912
4	2 3 23.21	1.9039	16 45 14.5	11.860	4	3 41 24.14	2.1966	24 47 11.1	7.801
5	2 5 17.59	1.9088	16 57 4.3	11.799	5	3 43 36.14	2.2035	24 54 55.8	7.688
6	2 7 12.27	1.9138	17 8 50.4	11.738	6	3 45 48.56	2.2104	25 2 33.7	7.573
7	2 9 7.25	1.9188	17 20 32.9	11.677	7	3 48 1.39	2.2172	25 10 4.6	7.458
8	2 11 2.53	1.9238	17 32 11.6	11.613	8	3 50 14.62	2.2240	25 17 28.6	7.342
9	2 12 58.11	1.9290	17 43 46.5	11.549	9	3 52 28.27	2.2310	25 24 45.6	7.223
10	2 14 54.01	1.9343	17 55 17.5	11.484	10	3 54 42.34	2.2378	25 31 55.4	7.104
11	2 16 50.22	1.9395	18 6 44.6	11.418	11	3 56 56.81	2.2446	25 38 58.1	6.984
12	2 18 46.75	1.9448	18 18 7.7	11.352	12	3 59 11.69	2.2514	25 45 53.5	6.862
13	2 20 43.60	1.9502	18 29 26.8	11.283	13	4 1 26.98	2.2583	25 52 41.5	6.739
14	2 22 40.77	1.9556	18 40 41.7	11.214	14	4 3 42.68	2.2651	25 59 22.2	6.615
15	2 24 38.27	1.9612	18 51 52.5	11.146	15	4 5 58.79	2.2719	26 5 55.3	6.489
16	2 26 36.11	1.9668	19 2 59.2	11.075	16	4 8 15.31	2.2787	26 12 20.9	6.363
17	2 28 34.28	1.9723	19 14 1.5	11.003	17	4 10 32.23	2.2853	26 18 38.8	6.234
18	2 30 32.79	1.9780	19 24 59.5	10.930	18	4 12 49.55	2.2920	26 24 49.0	6.105
19	2 32 31.64	1.9838	19 35 53.1	10.856	19	4 15 7.27	2.2988	26 30 51.4	5.975
20	2 34 30.84	1.9896	19 46 42.2	10.782	20	4 17 25.40	2.3054	26 36 46.0	5.843
21	2 36 30.39	1.9954	19 57 26.9	10.707	21	4 19 43.92	2.3120	26 42 32.6	5.709
22	2 38 30.29	2.0013	20 8 7.0	10.629	22	4 22 2.84	2.3186	26 48 11.1	5.574
23	2 40 30.55	2.0073	20 18 42.4	10.551	23	4 24 22.15	2.3251	26 53 41.5	5.439
24	2 42 31.16	2.0132	N. 20 29 13.1	10.472	24	4 26 41.85	2.3316	N. 26 59 3.8	5.303

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 5.					**SATURDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 26 41.85	2.3316	N. 26 59 3.8	5.303	0	6 24 38.60	2.5423	N. 28 14 32.1	2.506
1	4 29 1.94	2.3381	27 4 17.8	5.164	1	6 27 11.18	2.5437	28 11 56.3	2.686
2	4 31 22.42	2.3444	27 9 23.5	5.024	2	6 29 43.84	2.5449	28 9 9.8	2.866
3	4 33 43.27	2.3508	27 14 20.7	4.883	3	6 32 16.57	2.5460	28 6 12.4	3.047
4	4 36 4.51	2.3571	27 19 9.5	4.742	4	6 34 49.36	2.5470	28 3 4.2	3.228
5	4 38 26.12	2.3633	27 23 49.8	4.599	5	6 37 22.21	2.5479	27 59 45.1	3.408
6	4 40 48.11	2.3695	27 28 21.4	4.454	6	6 39 55.11	2.5487	27 56 15.2	3.589
7	4 43 10.46	2.3756	27 32 44.3	4.308	7	6 42 28.05	2.5492	27 52 34.4	3.770
8	4 45 33.18	2.3817	27 36 58.4	4.162	8	6 45 1.01	2.5496	27 48 42.8	3.951
9	4 47 56.26	2.3877	27 41 3.7	4.014	9	6 47 34.00	2.5499	27 44 40.3	4.133
10	4 50 19.70	2.3936	27 45 0.1	3.865	10	6 50 7.00	2.5501	27 40 26.9	4.313
11	4 52 43.49	2.3994	27 48 47.5	3.714	11	6 52 40.01	2.5502	27 36 2.7	4.494
12	4 55 7.63	2.4052	27 52 25.8	3.563	12	6 55 13.02	2.5500	27 31 27.6	4.676
13	4 57 32.11	2.4108	27 55 55.0	3.411	13	6 57 46.01	2.5497	27 26 41.6	4.857
14	4 59 56.93	2.4165	27 59 15.1	3.258	14	7 0 18.98	2.5493	27 21 44.8	5.037
15	5 2 22.09	2.4220	28 2 25.9	3.102	15	7 2 51.93	2.5488	27 16 37.2	5.217
16	5 4 47.57	2.4274	28 5 27.3	2.946	16	7 5 24.84	2.5481	27 11 18.8	5.398
17	5 7 13.38	2.4328	28 8 19.4	2.789	17	7 7 57.70	2.5473	27 5 49.5	5.578
18	5 9 39.51	2.4381	28 11 2.0	2.631	18	7 10 30.51	2.5463	27 0 9.5	5.757
19	5 12 5.95	2.4432	28 13 35.1	2.472	19	7 13 3.26	2.5453	26 54 18.7	5.936
20	5 14 32.69	2.4482	28 15 58.6	2.312	20	7 15 35.95	2.5442	26 48 17.2	6.115
21	5 16 59.73	2.4532	28 18 12.5	2.151	21	7 18 8.56	2.5428	26 42 4.9	6.293
22	5 19 27.07	2.4581	28 20 16.7	1.988	22	7 20 41.09	2.5414	26 35 42.0	6.471
23	5 21 54.70	2.4628	N. 28 22 11.1	1.825	23	7 23 13.53	2.5398	N. 26 29 8.4	6.649
	FRIDAY 6.					**SUNDAY 8.**			
0	5 24 22.61	2.4675	N. 28 23 55.7	1.661	0	7 25 45.87	2.5381	N. 26 22 24.1	6.827
1	5 26 50.80	2.4720	28 25 30.4	1.496	1	7 28 18.10	2.5363	26 15 29.2	7.003
2	5 29 19.25	2.4764	28 26 55.2	1.330	2	7 30 50.22	2.5343	26 8 23.8	7.178
3	5 31 47.97	2.4807	28 28 10.0	1.163	3	7 33 22.22	2.5323	26 1 7.8	7.354
4	5 34 16.94	2.4849	28 29 14.8	0.996	4	7 35 54.10	2.5302	25 53 41.3	7.528
5	5 36 46.16	2.4891	28 30 9.5	0.827	5	7 38 25.84	2.5279	25 46 4.4	7.703
6	5 39 15.63	2.4931	28 30 54.0	0.657	6	7 40 57.45	2.5256	25 38 17.0	7.876
7	5 41 45.33	2.4968	28 31 28.3	0.487	7	7 43 28.91	2.5231	25 30 19.3	8.048
8	5 44 15.25	2.5006	28 31 52.4	0.316	8	7 46 0.22	2.5205	25 22 11.3	8.219
9	5 46 45.40	2.5043	28 32 6.2	+0.143	9	7 48 31.37	2.5178	25 13 53.0	8.391
10	5 49 15.76	2.5077	28 32 9.6	—0.029	10	7 51 2.36	2.5151	25 5 24.4	8.561
11	5 51 46.32	2.5110	28 32 2.7	0.202	11	7 53 33.18	2.5122	24 56 45.7	8.729
12	5 54 17.08	2.5143	28 31 45.4	0.376	12	7 56 3.82	2.5092	24 47 56.9	8.898
13	5 56 48.03	2.5173	28 31 17.6	0.551	13	7 58 34.28	2.5061	24 38 58.0	9.065
14	5 59 19.16	2.5203	28 30 39.3	0.726	14	8 1 4.55	2.5029	24 29 49.1	9.231
15	6 1 50.46	2.5231	28 29 50.5	0.902	15	8 3 34.63	2.4998	24 20 30.3	9.396
16	6 4 21.93	2.5258	28 28 51.1	1.078	16	8 6 4.52	2.4964	24 11 1.6	9.560
17	6 6 53.55	2.5283	28 27 41.1	1.255	17	8 8 34.20	2.4930	24 1 23.1	9.723
18	6 9 25.32	2.5307	28 26 20.5	1.433	18	8 11 3.68	2.4895	23 51 34.9	9.884
19	6 11 57.23	2.5329	28 24 49.2	1.610	19	8 13 32.94	2.4859	23 41 37.0	10.046
20	6 14 29.27	2.5351	28 23 7.3	1.788	20	8 16 1.99	2.4823	23 31 29.4	10.206
21	6 17 1.44	2.5371	28 21 14.6	1.968	21	8 18 30.82	2.4787	23 21 12.3	10.364
22	6 19 33.72	2.5389	28 19 11.2	2.147	22	8 20 59.43	2.4749	23 10 45.7	10.522
23	6 22 6.11	2.5407	28 16 57.0	2.326	23	8 23 27.81	2.4710	23 0 9.7	10.678
24	6 24 38.60	2.5423	N. 28 14 32.1	2.506	24	8 25 55.95	2.4671	N. 22 49 24.4	10.833

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 9.					WEDNESDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 25 55.95	2.4671	N. 22 49 24.4	10.833	0	10 19 24.86	2.2640	N. 11 40 2.0	16.398
1	8 28 23.86	2.4632	22 38 29.8	10.986	1	10 21 40.59	2.2603	11 23 35.9	16.470
2	8 30 51.53	2.4592	22 27 26.1	11.138	2	10 23 56.10	2.2568	11 7 5.6	16.539
3	8 33 18.96	2.4552	22 16 13.3	11.289	3	10 26 11.41	2.2534	10 50 31.2	16.607
4	8 35 46.15	2.4511	22 4 51.4	11.439	4	10 28 26.51	2.2499	10 33 52.8	16.673
5	8 38 13.09	2.4469	21 53 20.6	11.587	5	10 30 41.40	2.2465	10 17 10.5	16.737
6	8 40 39.78	2.4428	21 41 41.0	11.733	6	10 32 56.09	2.2432	10 0 24.4	16.799
7	8 43 6.22	2.4385	21 29 52.6	11.879	7	10 35 10.58	2.2399	9 43 34.6	16.859
8	8 45 32.40	2.4343	21 17 55.5	12.023	8	10 37 24.88	2.2368	9 26 41.3	16.917
9	8 47 58.33	2.4300	21 5 49.9	12.165	9	10 39 39.00	2.2338	9 9 44.6	16.973
10	8 50 24.00	2.4257	20 53 35.7	12.307	10	10 41 52.93	2.2306	8 52 44.6	17.028
11	8 52 49.41	2.4213	20 41 13.1	12.446	11	10 44 6.67	2.2276	8 35 41.3	17.080
12	8 55 14.56	2.4169	20 28 42.2	12.583	12	10 46 20.24	2.2248	8 18 35.0	17.130
13	8 57 39.44	2.4125	20 16 3.1	12.719	13	10 48 33.64	2.2219	8 1 25.7	17.178
14	9 0 4.06	2.4081	20 3 15.9	12.854	14	10 50 46.87	2.2191	7 44 13.6	17.224
15	9 2 28.41	2.4037	19 50 20.6	12.988	15	10 52 59.93	2.2164	7 26 58.8	17.269
16	9 4 52.50	2.3993	19 37 17.4	13.119	16	10 55 12.84	2.2138	7 9 41.3	17.312
17	9 7 16.32	2.3948	19 24 6.3	13.249	17	10 57 25.59	2.2113	6 52 21.4	17.352
18	9 9 39.87	2.3903	19 10 47.5	13.377	18	10 59 38.19	2.2088	6 34 59.1	17.391
19	9 12 3.15	2.3858	18 57 21.1	13.503	19	11 1 50.64	2.2063	6 17 34.5	17.428
20	9 14 26.17	2.3813	18 43 47.1	13.629	20	11 4 2.95	2.2041	6 0 7.8	17.463
21	9 16 48.91	2.3768	18 30 5.6	13.752	21	11 6 15.13	2.2018	5 42 39.0	17.495
22	9 19 11.39	2.3724	18 16 16.8	13.873	22	11 8 27.17	2.1996	5 25 8.4	17.526
23	9 21 33.60	2.3679	N. 18 2 20.8	13.993	23	11 10 39.08	2.1975	N. 5 7 35.9	17.555
	TUESDAY 10.					THURSDAY 12.			
0	9 23 55.54	2.3634	N. 17 48 17.6	14.112	0	11 12 50.87	2.1955	N. 4 50 1.8	17.582
1	9 26 17.21	2.3589	17 34 7.4	14.228	1	11 15 2.54	2.1936	4 32 26.1	17.607
2	9 28 38.61	2.3545	17 19 50.3	14.342	2	11 17 14.10	2.1918	4 14 49.0	17.630
3	9 30 59.75	2.3501	17 5 26.4	14.455	3	11 19 25.55	2.1899	3 57 10.5	17.652
4	9 33 20.62	2.3457	16 50 55.7	14.567	4	11 21 36.89	2.1883	3 39 30.8	17.671
5	9 35 41.23	2.3413	16 36 18.4	14.675	5	11 23 48.14	2.1867	3 21 50.0	17.688
6	9 38 1.58	2.3369	16 21 34.7	14.783	6	11 25 59.29	2.1851	3 4 8.2	17.704
7	9 40 21.66	2.3325	16 6 44.5	14.888	7	11 28 10.35	2.1837	2 46 25.5	17.718
8	9 42 41.48	2.3283	15 51 48.1	14.992	8	11 30 21.33	2.1823	2 28 42.1	17.729
9	9 45 1.05	2.3239	15 36 45.5	15.094	9	11 32 32.23	2.1810	2 10 58.0	17.739
10	9 47 20.35	2.3196	15 21 36.8	15.194	10	11 34 43.05	2.1798	1 53 13.4	17.747
11	9 49 39.40	2.3154	15 6 22.2	15.293	11	11 36 53.81	2.1788	1 35 28.4	17.753
12	9 51 58.20	2.3113	14 51 1.7	15.389	12	11 39 4.50	2.1777	1 17 43.0	17.757
13	9 54 16.75	2.3070	14 35 35.5	15.483	13	11 41 15.13	2.1768	0 59 57.5	17.759
14	9 56 35.04	2.3028	14 20 3.7	15.576	14	11 43 25.71	2.1759	0 42 11.9	17.760
15	9 58 53.09	2.2988	14 4 26.4	15.667	15	11 45 36.24	2.1751	0 24 26.3	17.758
16	10 1 10.90	2.2948	13 48 43.7	15.755	16	11 47 46.72	2.1743	N. 0 6 40.9	17.755
17	10 3 28.46	2.2907	13 32 55.8	15.842	17	11 49 57.16	2.1738	S. 0 11 4.3	17.750
18	10 5 45.78	2.2868	13 17 2.7	15.928	18	11 52 7.57	2.1733	0 28 49.1	17.743
19	10 8 2.87	2.2828	13 1 4.5	16.011	19	11 54 17.95	2.1728	0 46 33.5	17.735
20	10 10 19.72	2.2790	12 45 1.4	16.092	20	11 56 28.30	2.1724	1 4 17.3	17.723
21	10 12 36.35	2.2752	12 28 53.5	16.171	21	11 58 38.64	2.1722	1 22 0.3	17.711
22	10 14 52.74	2.2713	12 12 40.9	16.248	22	12 0 48.96	2.1719	1 39 42.6	17.698
23	10 17 8.91	2.2677	11 56 23.7	16.324	23	12 2 59.27	2.1718	1 57 24.0	17.681
24	10 19 24.86	2.2640	N. 11 40 2.0	16.398	24	12 5 9.58	2.1718	S. 2 15 4.3	17.663

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 13.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	12 5 9.58	2.1718	S. 2 15 4.3	17.663
1	12 7 19.89	2.1719	2 32 43.5	17.643
2	12 9 30.21	2.1721	2 50 21.4	17.621
3	12 11 40.54	2.1723	3 7 58.0	17.598
4	12 13 50.88	2.1725	3 25 33.1	17.573
5	12 16 1.24	2.1729	3 43 6.7	17.546
6	12 18 11.63	2.1734	4 0 38.6	17.517
7	12 20 22.05	2.1740	4 18 8.7	17.486
8	12 22 32.51	2.1747	4 35 36.9	17.453
9	12 24 43.01	2.1754	4 53 3.1	17.420
10	12 26 53.56	2.1763	5 10 27.3	17.384
11	12 29 4.16	2.1771	5 27 49.2	17.346
12	12 31 14.81	2.1780	5 45 8.8	17.307
13	12 33 25.52	2.1791	6 2 26.0	17.265
14	12 35 36.30	2.1803	6 19 40.6	17.222
15	12 37 47.15	2.1815	6 36 52.6	17.178
16	12 39 58.08	2.1828	6 54 1.9	17.132
17	12 42 9.09	2.1842	7 11 8.4	17.083
18	12 44 20.18	2.1856	7 28 11.9	17.033
19	12 46 31.36	2.1872	7 45 12.4	16.982
20	12 48 42.64	2.1888	8 2 9.8	16.929
21	12 50 54.02	2.1905	8 19 3.9	16.874
22	12 53 5.50	2.1923	8 35 54.7	16.818
23	12 55 17.09	2.1941	S. 8 52 42.0	16.759

SATURDAY 14.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	12 57 28.79	2.1960	S. 9 9 25.8	16.699
1	12 59 40.61	2.1980	9 26 5.9	16.638
2	13 1 52.55	2.2001	9 42 42.3	16.575
3	13 4 4.62	2.2022	9 59 14.9	16.510
4	13 6 16.81	2.2043	10 15 43.5	16.443
5	13 8 29.14	2.2067	10 32 8.1	16.375
6	13 10 41.61	2.2091	10 48 28.5	16.305
7	13 12 54.23	2.2115	11 4 44.7	16.233
8	13 15 6.99	2.2139	11 20 56.5	16.160
9	13 17 19.90	2.2165	11 37 3.9	16.086
10	13 19 32.97	2.2192	11 53 6.8	16.009
11	13 21 46.20	2.2218	12 9 5.0	15.932
12	13 23 59.59	2.2246	12 24 58.6	15.853
13	13 26 13.15	2.2273	12 40 47.3	15.771
14	13 28 26.87	2.2302	12 56 31.1	15.689
15	13 30 40.77	2.2332	13 12 10.0	15.605
16	13 32 54.85	2.2362	13 27 43.7	15.518
17	13 35 9.11	2.2393	13 43 12.2	15.431
18	13 37 23.56	2.2424	13 58 35.4	15.343
19	13 39 38.20	2.2455	14 13 53.3	15.253
20	13 41 53.02	2.2487	14 29 5.7	15.160
21	13 44 8.04	2.2520	14 44 12.5	15.067
22	13 46 23.26	2.2553	14 59 13.7	14.972
23	13 48 38.68	2.2588	15 14 9.1	14.875
24	13 50 54.31	2.2622	S. 15 28 58.7	14.777

SUNDAY 15.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	13 50 54.31	2.2622	S. 15 28 58.7	14.777
1	13 53 10.14	2.2656	15 43 42.3	14.678
2	13 55 26.18	2.2692	15 58 20.0	14.577
3	13 57 42.44	2.2728	16 12 51.5	14.474
4	13 59 58.91	2.2763	16 27 16.9	14.371
5	14 2 15.59	2.2799	16 41 36.0	14.265
6	14 4 32.50	2.2837	16 55 48.7	14.158
7	14 6 49.63	2.2873	17 9 55.0	14.050
8	14 9 6.98	2.2911	17 23 54.7	13.939
9	14 11 24.56	2.2948	17 37 47.7	13.828
10	14 13 42.36	2.2987	17 51 34.1	13.716
11	14 16 0.40	2.3025	18 5 13.6	13.602
12	14 18 18.66	2.3063	18 18 46.3	13.487
13	14 20 37.16	2.3103	18 32 12.0	13.369
14	14 22 55.89	2.3142	18 45 30.6	13.252
15	14 25 14.86	2.3182	18 58 42.2	13.133
16	14 27 34.07	2.3222	19 11 46.5	13.011
17	14 29 53.52	2.3262	19 24 43.5	12.889
18	14 32 13.21	2.3302	19 37 33.2	12.766
19	14 34 33.14	2.3341	19 50 15.4	12.641
20	14 36 53.30	2.3381	20 2 50.1	12.514
21	14 39 13.71	2.3422	20 15 17.1	12.387
22	14 41 34.36	2.3462	20 27 36.5	12.258
23	14 43 55.25	2.3502	S. 20 39 48.1	12.128

MONDAY 16.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	14 46 16.38	2.3543	S. 20 51 51.9	11.997
1	14 48 37.76	2.3583	21 3 47.8	11.864
2	14 50 59.38	2.3623	21 15 35.6	11.730
3	14 53 21.24	2.3664	21 27 15.4	11.595
4	14 55 43.35	2.3705	21 38 47.0	11.458
5	14 58 5.70	2.3744	21 50 10.4	11.321
6	15 0 28.28	2.3784	22 1 25.5	11.183
7	15 2 51.11	2.3825	22 12 32.3	11.043
8	15 5 14.18	2.3864	22 23 30.6	10.901
9	15 7 37.48	2.3903	22 34 20.4	10.759
10	15 10 1.02	2.3943	22 45 1.7	10.617
11	15 12 24.79	2.3982	22 55 34.4	10.472
12	15 14 48.80	2.4021	23 5 58.3	10.326
13	15 17 13.04	2.4059	23 16 13.5	10.179
14	15 19 37.51	2.4098	23 26 19.8	10.031
15	15 22 2.21	2.4136	23 36 17.2	9.883
16	15 24 27.14	2.4173	23 46 5.7	9.733
17	15 26 52.28	2.4209	23 55 45.2	9.582
18	15 29 17.65	2.4247	24 5 15.5	9.430
19	15 31 43.24	2.4283	24 14 36.8	9.278
20	15 34 9.04	2.4318	24 23 48.8	9.123
21	15 36 35.06	2.4353	24 32 51.6	8.969
22	15 39 1.28	2.4388	24 41 45.1	8.813
23	15 41 27.71	2.4422	24 50 29.2	8.657
24	15 43 54.34	2.4455	S. 24 59 3.9	8.499

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 17.					THURSDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 43 54.34	2.4455	S. 24 59 3.9	8.499	0	17 43 29.92	2.4958	S. 28 34 9.2	0.351
1	15 46 21.17	2.4488	25 7 29.1	8.341	1	17 45 59.61	2.4939	28 34 25.1	0.180
2	15 48 48.20	2.4521	25 15 44.8	8.182	2	17 48 29.19	2.4920	28 34 30.8	−0.009
3	15 51 15.42	2.4553	25 23 50.9	8.022	3	17 50 58.65	2.4899	28 34 26.2	+0.162
4	15 53 42.83	2.4583	25 31 47.4	7.862	4	17 53 27.98	2.4877	28 34 11.4	0.332
5	15 56 10.42	2.4613	25 39 34.3	7.700	5	17 55 57.17	2.4853	28 33 46.4	0.502
6	15 58 38.19	2.4643	25 47 11.4	7.537	6	17 58 26.22	2.4829	28 33 11.2	0.672
7	16 1 6.13	2.4671	25 54 38.7	7.373	7	18 0 55.12	2.4803	28 32 25.8	0.840
8	16 3 34.24	2.4699	26 1 56.2	7.210	8	18 3 23.86	2.4777	28 31 30.4	1.008
9	16 6 2.52	2.4727	26 9 3.9	7.046	9	18 5 52.44	2.4749	28 30 24.9	1.175
10	16 8 30.96	2.4753	26 16 1.7	6.880	10	18 8 20.85	2.4720	28 29 9.4	1.343
11	16 10 59.55	2.4778	26 22 49.5	6.714	11	18 10 49.08	2.4689	28 27 43.8	1.509
12	16 13 28.30	2.4803	26 29 27.4	6.548	12	18 13 17.12	2.4658	28 26 8.3	1.674
13	16 15 57.19	2.4827	26 35 55.3	6.381	13	18 15 44.97	2.4625	28 24 22.9	1.839
14	16 18 26.22	2.4849	26 42 13.1	6.213	14	18 18 12.62	2.4591	28 22 27.6	2.004
15	16 20 55.38	2.4871	26 48 20.8	6.044	15	18 20 40.06	2.4556	28 20 22.4	2.168
16	16 23 24.67	2.4892	26 54 18.4	5.876	16	18 23 7.29	2.4520	28 18 7.5	2.330
17	16 25 54.08	2.4912	27 0 5.9	5.707	17	18 25 34.30	2.4483	28 15 42.8	2.493
18	16 28 23.61	2.4930	27 5 43.2	5.537	18	18 28 1.08	2.4444	28 13 8.4	2.654
19	16 30 53.24	2.4948	27 11 10.3	5.367	19	18 30 27.63	2.4405	28 10 24.3	2.814
20	16 33 22.98	2.4965	27 16 27.2	5.196	20	18 32 53.94	2.4365	28 7 30.7	2.974
21	16 35 52.82	2.4981	27 21 33.8	5.024	21	18 35 20.01	2.4324	28 4 27.4	3.133
22	16 38 22.75	2.4995	27 26 30.1	4.853	22	18 37 45.83	2.4282	28 1 14.7	3.291
23	16 40 52.76	2.5009	S. 27 31 16.2	4.682	23	18 40 11.39	2.4238	S. 27 57 52.5	3.448
	WEDNESDAY 18.					FRIDAY 20.			
0	16 43 22.86	2.5022	S. 27 35 51.9	4.509	0	18 42 36.69	2.4194	S. 27 54 20.9	3.605
1	16 45 53.02	2.5033	27 40 17.3	4.337	1	18 45 1.72	2.4149	27 50 39.9	3.760
2	16 48 23.25	2.5043	27 44 32.3	4.164	2	18 47 26.48	2.4103	27 46 49.7	3.914
3	16 50 53.53	2.5052	27 48 37.0	3.992	3	18 49 50.95	2.4055	27 42 50.2	4.068
4	16 53 23.87	2.5059	27 52 31.3	3.818	4	18 52 15.14	2.4008	27 38 41.5	4.221
5	16 55 54.24	2.5066	27 56 15.1	3.644	5	18 54 39.05	2.3960	27 34 23.7	4.373
6	16 58 24.66	2.5072	27 59 48.6	3.472	6	18 57 2.66	2.3910	27 29 56.8	4.523
7	17 0 55.10	2.5075	28 3 11.7	3.298	7	18 59 25.97	2.3860	27 25 20.9	4.673
8	17 3 25.56	2.5078	28 6 24.3	3.123	8	19 1 48.98	2.3809	27 20 36.1	4.821
9	17 5 56.04	2.5081	28 9 26.5	2.950	9	19 4 11.68	2.3757	27 15 42.4	4.969
10	17 8 26.53	2.5082	28 12 18.3	2.776	10	19 6 34.06	2.3704	27 10 39.8	5.116
11	17 10 57.02	2.5081	28 14 59.6	2.602	11	19 8 56.13	2.3652	27 5 28.5	5.261
12	17 13 27.50	2.5079	28 17 30.5	2.428	12	19 11 17.88	2.3598	27 0 8.5	5.405
13	17 15 57.97	2.5076	28 19 51.0	2.254	13	19 13 39.30	2.3543	26 54 39.9	5.548
14	17 18 28.41	2.5071	28 22 1.0	2.080	14	19 16 0.39	2.3488	26 49 2.7	5.690
15	17 20 58.82	2.5065	28 24 0.6	1.907	15	19 18 21.15	2.3432	26 43 17.1	5.831
16	17 23 29.19	2.5058	28 25 49.8	1.733	16	19 20 41.57	2.3376	26 37 23.0	5.972
17	17 25 59.52	2.5051	28 27 28.5	1.559	17	19 23 1.66	2.3319	26 31 20.5	6.110
18	17 28 29.80	2.5041	28 28 56.9	1.387	18	19 25 21.40	2.3261	26 25 9.8	6.248
19	17 31 0.01	2.5030	28 30 14.9	1.213	19	19 27 40.79	2.3203	26 18 50.8	6.383
20	17 33 30.16	2.5018	28 31 22.4	1.039	20	19 29 59.83	2.3145	26 12 23.8	6.518
21	17 36 0.23	2.5005	28 32 19.6	0.867	21	19 32 18.53	2.3087	26 5 48.6	6.653
22	17 38 30.22	2.4991	28 33 6.5	0.695	22	19 34 36.87	2.3027	25 59 5.4	6.786
23	17 41 0.12	2.4975	28 33 43.0	0.523	23	19 36 54.85	2.2967	25 52 14.3	6.918
24	17 43 29.92	2.4958	S. 28 34 9.2	0.351	24	19 39 12.47	2.2906	S. 25 45 15.3	7.048

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 21.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	19 39 12.47	2.2906	S. 25 45 15.3	7.048
1	19 41 29.72	2.2845	25 38 8.5	7.178
2	19 43 46.61	2.2785	25 30 54.0	7.305
3	19 46 3.14	2.2724	25 23 31.9	7.432
4	19 48 19.30	2.2663	25 16 2.2	7.558
5	19 50 35.09	2.2600	25 8 25.0	7.682
6	19 52 50.50	2.2538	25 0 40.4	7.804
7	19 55 5.54	2.2476	24 52 48.5	7.927
8	19 57 20.21	2.2413	24 44 49.2	8.048
9	19 59 34.50	2.2351	24 36 42.8	8.167
10	20 1 48.42	2.2288	24 28 29.2	8.285
11	20 4 1.96	2.2225	24 20 8.6	8.402
12	20 6 15.12	2.2162	24 11 41.0	8.518
13	20 8 27.90	2.2098	24 3 6.5	8.632
14	20 10 40.30	2.2035	23 54 25.2	8.744
15	20 12 52.32	2.1972	23 45 37.2	8.856
16	20 15 3.96	2.1908	23 36 42.5	8.967
17	20 17 15.22	2.1845	23 27 41.2	9.076
18	20 19 26.10	2.1782	23 18 33.4	9.183
19	20 21 36.60	2.1718	23 9 19.2	9.291
20	20 23 46.72	2.1655	22 59 58.5	9.397
21	20 25 56.46	2.1592	22 50 31.6	9.500
22	20 28 5.82	2.1528	22 40 58.5	9.603
23	20 30 14.80	2.1465	S. 22 31 19.2	9.705

SUNDAY 22.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	20 32 23.40	2.1402	S. 22 21 33.9	9.805
1	20 34 31.62	2.1338	22 11 42.6	9.904
2	20 36 39.46	2.1276	22 1 45.4	10.002
3	20 38 46.93	2.1213	21 51 42.4	10.098
4	20 40 54.02	2.1151	21 41 33.6	10.194
5	20 43 0.74	2.1089	21 31 19.1	10.288
6	20 45 7.09	2.1027	21 20 59.0	10.381
7	20 47 13.06	2.0965	21 10 33.4	10.473
8	20 49 18.67	2.0904	21 0 2.3	10.563
9	20 51 23.91	2.0843	20 49 25.8	10.652
10	20 53 28.78	2.0781	20 38 44.1	10.739
11	20 55 33.28	2.0721	20 27 57.1	10.827
12	20 57 37.43	2.0661	20 17 4.9	10.913
13	20 59 41.21	2.0600	20 6 7.6	10.996
14	21 1 44.63	2.0541	19 55 5.4	11.078
15	21 3 47.70	2.0482	19 43 58.2	11.160
16	21 5 50.41	2.0423	19 32 46.2	11.240
17	21 7 52.77	2.0363	19 21 29.4	11.320
18	21 9 54.77	2.0305	19 10 7.8	11.398
19	21 11 56.43	2.0248	18 58 41.6	11.475
20	21 13 57.74	2.0190	18 47 10.8	11.551
21	21 15 58.71	2.0133	18 35 35.5	11.625
22	21 17 59.34	2.0077	18 23 55.8	11.698
23	21 19 59.63	2.0020	18 12 11.7	11.771
24	21 21 59.58	1.9964	S. 18 0 23.3	11.842

MONDAY 23.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	21 21 59.58	1.9964	S. 18 0 23.3	11.842
1	21 23 59.20	1.9909	17 48 30.7	11.912
2	21 25 58.49	1.9854	17 36 33.9	11.980
3	21 27 57.45	1.9799	17 24 33.1	12.047
4	21 29 56.08	1.9746	17 12 28.3	12.113
5	21 31 54.40	1.9693	17 0 19.5	12.179
6	21 33 52.40	1.9640	16 48 6.8	12.243
7	21 35 50.08	1.9588	16 35 50.4	12.305
8	21 37 47.45	1.9536	16 23 30.2	12.368
9	21 39 44.51	1.9484	16 11 6.3	12.428
10	21 41 41.26	1.9433	15 58 38.8	12.488
11	21 43 37.70	1.9383	15 46 7.8	12.547
12	21 45 33.85	1.9333	15 33 33.2	12.604
13	21 47 29.70	1.9284	15 20 55.3	12.659
14	21 49 25.26	1.9236	15 8 14.1	12.714
15	21 51 20.53	1.9188	14 55 29.6	12.768
16	21 53 15.51	1.9139	14 42 41.9	12.822
17	21 55 10.20	1.9093	14 29 51.0	12.874
18	21 57 4.62	1.9046	14 16 57.0	12.925
19	21 58 58.75	1.9000	14 4 0.0	12.974
20	22 0 52.62	1.8956	13 51 0.1	13.023
21	22 2 46.22	1.8910	13 37 57.3	13.071
22	22 4 39.54	1.8866	13 24 51.6	13.118
23	22 6 32.61	1.8823	S. 13 11 43.1	13.163

TUESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	22 8 25.42	1.8781	S. 12 58 32.0	13.208
1	22 10 17.98	1.8738	12 45 18.2	13.252
2	22 12 10.28	1.8697	12 32 1.8	13.294
3	22 14 2.34	1.8656	12 18 42.9	13.335
4	22 15 54.15	1.8615	12 5 21.6	13.376
5	22 17 45.72	1.8576	11 51 57.8	13.416
6	22 19 37.06	1.8537	11 38 31.7	13.454
7	22 21 28.16	1.8498	11 25 3.3	13.492
8	22 23 19.03	1.8460	11 11 32.6	13.529
9	22 25 9.68	1.8423	10 57 59.8	13.564
10	22 27 0.11	1.8387	10 44 24.9	13.599
11	22 28 50.32	1.8351	10 30 47.9	13.633
12	22 30 40.32	1.8316	10 17 8.9	13.666
13	22 32 30.11	1.8281	10 3 28.0	13.698
14	22 34 19.69	1.8247	9 49 45.2	13.729
15	22 36 9.07	1.8213	9 36 0.5	13.759
16	22 37 58.25	1.8181	9 22 14.1	13.788
17	22 39 47.24	1.8149	9 8 26.0	13.815
18	22 41 36.04	1.8118	8 54 36.3	13.843
19	22 43 24.65	1.8088	8 40 44.9	13.869
20	22 45 13.09	1.8058	8 26 52.0	13.894
21	22 47 1.34	1.8028	8 12 57.6	13.919
22	22 48 49.42	1.7999	7 59 1.7	13.943
23	22 50 37.33	1.7972	7 45 4.4	13.965
24	22 52 25.08	1.7944	S. 7 31 5.9	13.987

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 25.					FRIDAY 27			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 52 25.08	1.7944	S. 7 31 5.9	13.987	0	0 16 41.20	1.7429	N. 3 49 43.8	14.079
1	22 54 12.66	1.7918	7 17 6.0	14.008	1	0 18 25.79	1.7435	4 3 48.1	14.062
2	22 56 0.09	1.7892	7 3 4.9	14.028	2	0 20 10.42	1.7442	4 17 51.3	14.044
3	22 57 47.36	1.7866	6 49 2.6	14.048	3	0 21 55.09	1.7449	4 31 53.4	14.027
4	22 59 34.48	1.7842	6 34 59.2	14.066	4	0 23 39.81	1.7458	4 45 54.5	14.008
5	23 1 21.46	1.7818	6 20 54.7	14.083	5	0 25 24.58	1.7466	4 59 54.4	13.988
6	23 3 8.29	1.7794	6 6 49.2	14.099	6	0 27 9.40	1.7475	5 13 53.1	13.968
7	23 4 54.99	1.7772	5 52 42.8	14.115	7	0 28 54.28	1.7485	5 27 50.5	13.947
8	23 6 41.55	1.7749	5 38 35.4	14.131	8	0 30 39.22	1.7495	5 41 46.7	13.925
9	23 8 27.98	1.7728	5 24 27.1	14.145	9	0 32 24.22	1.7507	5 55 41.5	13.902
10	23 10 14.29	1.7708	5 10 18.0	14.158	10	0 34 9.30	1.7519	6 9 34.9	13.878
11	23 12 0.48	1.7688	4 56 8.1	14.171	11	0 35 54.45	1.7532	6 23 26.9	13.855
12	23 13 46.55	1.7668	4 41 57.5	14.183	12	0 37 39.68	1.7545	6 37 17.5	13.831
13	23 15 32.50	1.7650	4 27 46.2	14.193	13	0 39 24.99	1.7559	6 51 6.6	13.805
14	23 17 18.35	1.7633	4 13 34.3	14.203	14	0 41 10.39	1.7574	7 4 54.1	13.778
15	23 19 4.09	1.7615	3 59 21.8	14.213	15	0 42 55.88	1.7589	7 18 40.0	13.752
16	23 20 49.73	1.7598	3 45 8.8	14.221	16	0 44 41.46	1.7605	7 32 24.3	13.724
17	23 22 35.27	1.7583	3 30 55.3	14.228	17	0 46 27.14	1.7622	7 46 6.9	13.695
18	23 24 20.72	1.7568	3 16 41.4	14.235	18	0 48 12.92	1.7639	7 59 47.7	13.666
19	23 26 6.08	1.7553	3 2 27.1	14.241	19	0 49 58.81	1.7658	8 13 26.8	13.637
20	23 27 51.36	1.7539	2 48 12.5	14.246	20	0 51 44.81	1.7676	8 27 4.1	13.606
21	23 29 36.55	1.7526	2 33 57.6	14.251	21	0 53 30.92	1.7695	8 40 39.5	13.574
22	23 31 21.67	1.7513	2 19 42.4	14.254	22	0 55 17.15	1.7716	8 54 13.0	13.542
23	23 33 6.71	1.7502	S. 2 5 27.1	14.257	23	0 57 3.51	1.7737	N. 9 7 44.5	13.509
	THURSDAY 26.					SATURDAY 28.			
0	23 34 51.69	1.7491	S. 1 51 11.6	14.259	0	0 58 49.99	1.7758	N. 9 21 14.1	13.476
1	23 36 36.60	1.7480	1 36 56.0	14.260	1	1 0 36.60	1.7779	9 34 41.6	13.441
2	23 38 21.45	1.7471	1 22 40.4	14.260	2	1 2 23.34	1.7803	9 48 7.0	13.406
3	23 40 6.25	1.7462	1 8 24.8	14.260	3	1 4 10.23	1.7826	10 1 30.3	13.370
4	23 41 50.99	1.7453	0 54 9.2	14.259	4	1 5 57.25	1.7850	10 14 51.4	13.333
5	23 43 35.68	1.7445	0 39 53.7	14.258	5	1 7 44.43	1.7875	10 28 10.3	13.297
6	23 45 20.33	1.7438	0 25 38.3	14.255	6	1 9 31.75	1.7900	10 41 27.0	13.258
7	23 47 4.94	1.7433	S. 0 11 23.1	14.251	7	1 11 19.23	1.7925	10 54 41.3	13.219
8	23 48 49.52	1.7427	N. 0 2 51.8	14.247	8	1 13 6.86	1.7952	11 7 53.3	13.180
9	23 50 34.06	1.7422	0 17 6.5	14.243	9	1 14 54.65	1.7979	11 21 2.9	13.139
10	23 52 18.58	1.7418	0 31 20.9	14.237	10	1 16 42.61	1.8007	11 34 10.0	13.098
11	23 54 3.07	1.7414	0 45 34.9	14.230	11	1 18 30.74	1.8037	11 47 14.6	13.056
12	23 55 47.55	1.7412	0 59 48.5	14.223	12	1 20 19.05	1.8066	12 0 16.7	13.013
13	23 57 32.01	1.7409	1 14 1.6	14.215	13	1 22 7.53	1.8095	12 13 16.2	12.970
14	23 59 16.46	1.7408	1 28 14.3	14.207	14	1 23 56.19	1.8126	12 26 13.1	12.926
15	0 1 0.90	1.7407	1 42 26.4	14.198	15	1 25 45.04	1.8158	12 39 7.3	12.881
16	0 2 45.34	1.7406	1 56 38.0	14.188	16	1 27 34.08	1.8189	12 51 58.8	12.835
17	0 4 29.77	1.7406	2 10 48.9	14.176	17	1 29 23.31	1.8221	13 4 47.5	12.788
18	0 6 14.21	1.7408	2 24 59.1	14.164	18	1 31 12.73	1.8254	13 17 33.4	12.742
19	0 7 58.67	1.7410	2 39 8.6	14.153	19	1 33 2.36	1.8288	13 30 16.5	12.693
20	0 9 43.13	1.7412	2 53 17.4	14.139	20	1 34 52.18	1.8322	13 42 56.6	12.643
21	0 11 27.61	1.7415	3 7 25.3	14.125	21	1 36 42.22	1.8358	13 55 33.7	12.594
22	0 13 12.11	1.7419	3 21 32.4	14.111	22	1 38 32.47	1.8393	14 8 7.9	12.544
23	0 14 56.64	1.7424	3 35 38.6	14.095	23	1 40 22.93	1.8428	14 20 39.0	12.492
24	0 16 41.20	1.7429	N. 3 49 43.8	14.079	24	1 42 13.61	1.8466	N. 14 33 6.9	12.439

GREENWICH MEAN TIME.

PHASES OF THE MOON.

			d	h	m
☽	**First Quarter**	Feb.	2	22	32.6
○	**Full Moon**		10	5	34.7
☾	**Last Quarter**		16	21	23.0
●	**New Moon**		24	12	2.1

			d	h
☾	**Perigee**	Feb.	12	1.5
☾	**Apogee**		27	21.2

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	22 46 27.50	9.377	S. 7 47 29.5	+56.85	16 10.13	65.45	12 38.39	0.477
Mon.	2	22 50 12.29	9.356	7 24 42.0	57.12	16 9.89	65.38	12 26.66	0.499
Tues.	3	22 53 56.57	9.335	7 1 48.1	57.37	16 9.65	65.31	12 14.42	0.520
Wed.	4	22 57 40.35	9.315	6 38 48.4	+57.60	16 9.41	65.24	12 1.68	0.541
Thur.	5	23 1 23.65	9.296	6 15 43.3	57.82	16 9.17	65.17	11 48.46	0.561
Frid.	6	23 5 6.49	9.277	5 52 33.1	58.02	16 8.93	65.11	11 34.78	0.579
Sat.	7	23 8 48.88	9.258	5 29 18.4	+58.21	16 8.68	65.05	11 20.66	0.597
SUN.	8	23 12 30.85	9.240	5 5 59.4	58.38	16 8.43	64.99	11 6.11	0.614
Mon.	9	23 16 12.42	9.224	4 42 36.5	58.54	16 8.18	64.93	10 51.16	0.631
Tues.	10	23 19 53.61	9.209	4 19 10.0	+58.67	16 7.92	64.88	10 35.85	0.646
Wed.	11	23 23 34.45	9.195	3 55 40.4	58.79	16 7.66	64.83	10 20.18	0.660
Thur.	12	23 27 14.95	9.182	3 32 7.9	58.90	16 7.40	64.78	10 4.17	0.673
Frid.	13	23 30 55.15	9.170	3 8 32.9	+59.00	16 7.13	64.73	9 47.86	0.685
Sat.	14	23 34 35.07	9.158	2 44 55.8	59.08	16 6.86	64.69	9 31.27	0.696
SUN.	15	23 38 14.73	9.148	2 21 16.9	59.15	16 6.59	64.65	9 14.42	0.707
Mon.	16	23 41 54.17	9.139	1 57 36.5	+59.21	16 6.32	64.62	8 57.34	0.716
Tues.	17	23 45 33.39	9.130	1 33 54.8	59.25	16 6.05	64.59	8 40.06	0.724
Wed.	18	23 49 12.43	9.122	1 10 12.4	59.28	16 5.78	64.56	8 22.59	0.731
Thur.	19	23 52 51.29	9.116	0 46 29.6	+59.29	16 5.50	64.53	8 4.94	0.738
Frid.	20	23 56 30.00	9.110	S. 0 22 46.8	59.28	16 5.22	64.51	7 47.15	0.744
Sat.	21	0 0 8.58	9.105	N. 0 0 55.7	59.26	16 4.94	64.49	7 29.24	0.749
SUN.	22	0 3 47.06	9.101	0 24 37.5	+59.22	16 4.66	64.47	7 11.22	0.753
Mon.	23	0 7 25.46	9.098	0 48 18.2	59.16	16 4.38	64.46	6 53.10	0.757
Tues.	24	0 11 3.77	9.095	1 11 57.4	59.09	16 4.10	64.45	6 34.91	0.760
Wed.	25	0 14 42.02	9.093	1 35 34.7	+59.01	16 3.82	64.44	6 16.67	0.761
Thur.	26	0 18 20.24	9.092	1 59 9.8	58.91	16 3.54	64.44	5 58.39	0.762
Frid.	27	0 21 58.44	9.092	2 22 42.3	58.79	16 3.27	64.44	5 40.08	0.763
Sat.	28	0 25 36.64	9.092	2 46 11.8	+58.66	16 2.99	64.44	5 21.77	0.763
SUN.	29	0 29 14.85	9.093	3 9 38.0	58.51	16 2.72	64.44	5 3.48	0.762
Mon.	30	0 32 53.10	9.095	3 33 0.4	58.35	16 2.44	64.45	4 45.22	0.760
Tues.	31	0 36 31.39	9.097	3 56 18.7	58.17	16 2.17	64.46	4 27.01	0.758
Wed.	32	0 40 9.75	9.100	N. 4 19 32.6	+57.98	16 1.89	64.47	4 8.86	0.755

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0ˢ.18 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	22 46 25.52	9.379	S. 7 47 41.5	+56.85	12 38.49	0.477	22 33 47.04
Mon.	2	22 50 10.35	9.357	7 24 53.8	57.12	12 26.77	0.499	22 37 43.59
Tues.	3	22 53 54.67	9.336	7 1 59.8	57.37	12 14.53	0.520	22 41 40.14
Wed.	4	22 57 38.49	9.316	6 38 59.9	+57.60	12 1.79	0.541	22 45 36.70
Thur.	5	23 1 21.83	9.296	6 15 54.6	57.82	11 48.57	0.561	22 49 33.25
Frid.	6	23 5 4.70	9.277	5 52 44.3	58.02	11 34.89	0.579	22 53 29.80
Sat.	7	23 8 47.13	9.259	5 29 29.4	+58.21	11 20.77	0.597	22 57 26.36
SUN.	8	23 12 29.14	9.242	5 6 10.2	58.38	11 6.23	0.614	23 1 22.91
Mon.	9	23 16 10.75	9.226	4 42 47.1	58.54	10 51.28	0.631	23 5 19.47
Tues.	10	23 19 51.98	9.211	4 19 20.4	+58.68	10 35.96	0.646	23 9 16.02
Wed.	11	23 23 32.86	9.196	3 55 50.6	58.80	10 20.29	0.660	23 13 12.58
Thur.	12	23 27 13.41	9.183	3 32 17.9	58.91	10 4.28	0.673	23 17 9.13
Frid.	13	23 30 53.65	9.171	3 8 42.6	+59.01	9 47.97	0.685	23 21 5.68
Sat.	14	23 34 33.61	9.160	2 45 5.2	59.10	9 31.38	0.696	23 25 2.24
SUN.	15	23 38 13.32	9.150	2 21 26.0	59.17	9 14.53	0.707	23 28 58.79
Mon.	16	23 41 52.80	9.141	1 57 45.3	+59.22	8 57.45	0.716	23 32 55.34
Tues.	17	23 45 32.06	9.132	1 34 3.4	59.26	8 40.16	0.724	23 36 51.90
Wed.	18	23 49 11.14	9.124	1 10 20.8	59.29	8 22.68	0.731	23 40 48.45
Thur.	19	23 52 50.05	9.118	0 46 37.7	+59.30	8 5.04	0.738	23 44 45.00
Frid.	20	23 56 28.81	9.113	S. 0 22 54.6	59.29	7 47.25	0.744	23 48 41.56
Sat.	21	0 0 7.44	9.108	N. 0 0 48.2	59.27	7 29.33	0.749	23 52 38.11
SUN.	22	0 3 45.97	9.104	0 24 30.3	+59.23	7 11.31	0.753	23 56 34.66
Mon.	23	0 7 24.41	9.100	0 48 11.3	59.18	6 53.19	0.757	0 0 31.22
Tues.	24	0 11 2.77	9.097	1 11 50.8	59.11	6 34.99	0.760	0 4 27.77
Wed.	25	0 14 41.07	9.095	1 35 28.5	+59.03	6 16.74	0.761	0 8 24.33
Thur.	26	0 18 19.34	9.094	1 59 3.9	58.93	5 58.46	0.762	0 12 20.88
Frid.	27	0 21 57.59	9.094	2 22 36.7	58.81	5 40.15	0.763	0 16 17.43
Sat.	28	0 25 35.83	9.094	2 46 6.6	+58.68	5 21.84	0.763	0 20 13.99
SUN.	29	0 29 14.09	9.095	3 9 33.1	58.53	5 3.55	0.762	0 24 10.54
Mon.	30	0 32 52.38	9.097	3 32 55.8	58.36	4 45.28	0.760	0 28 7.10
Tues.	31	0 36 30.72	9.099	3 56 14.4	58.18	4 27.06	0.758	0 32 3.65
Wed.	32	0 40 9.12	9.102	N. 4 19 28.6	+57.99	4 8.91	0.755	0 36 0.20

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations increasing.

Diff. for 1 Hour,
$+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		True Longitude.		Diff. for 1 Hour.	Latitude.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	60	340 4 52.8	4 39.4	150.53	+0.59	9.996 1182	+44.1	1 25 58.84
2	61	341 5 4.6	4 51.0	150.45	0.68	9.996 2245	44.5	1 22 2.93
3	62	342 5 14.3	5 0.7	150.36	0.73	9.996 3315	44.8	1 18 7.02
4	63	343 5 21.9	5 8.2	150.28	+0.76	9.996 4393	+45.1	1 14 11.12
5	64	344 5 27.5	5 13.6	150.19	0.76	9.996 5481	45.5	1 10 15.21
6	65	345 5 30.8	5 16.9	150.10	0.74	9.996 6580	46.0	1 6 19.30
7	66	346 5 32.0	5 18.0	150.01	+0.69	9.996 7689	+46.5	1 2 23.39
8	67	347 5 31.1	5 16.9	149.92	0.59	9.996 8810	47.0	0 58 27.48
9	68	348 5 28.0	5 13.7	149.83	0.47	9.996 9944	47.5	0 54 31.58
10	69	349 5 22.8	5 8.4	149.74	+0.34	9.997 1092	+48.1	0 50 35.67
11	70	350 5 15.6	5 1.0	149.66	0.21	9.997 2255	48.7	0 46 39.76
12	71	351 5 6.3	4 51.6	149.58	+0.07	9.997 3432	49.3	0 42 43.85
13	72	352 4 55.1	4 40.4	149.50	−0.06	9.997 4623	+49.9	0 38 47.94
14	73	353 4 42.1	4 27.2	149.42	0.19	9.997 5828	50.4	0 34 52.04
15	74	354 4 27.3	4 12.3	149.35	0.28	9.997 7044	50.9	0 30 56.13
16	75	355 4 10.7	3 55.6	149.27	−0.35	9.997 8272	+51.3	0 27 0.22
17	76	356 3 52.4	3 37.2	149.20	0.40	9.997 9509	51.7	0 23 4.31
18	77	357 3 32.5	3 17.2	149.13	0.40	9.998 0753	51.9	0 19 8.40
19	78	358 3 10.8	2 55.4	149.06	−0.38	9.998 2002	+52.1	0 15 12.50
20	79	359 2 47.4	2 31.8	148.99	0.32	9.998 3256	52.2	0 11 16.59
21	80	0 2 22.2	2 6.5	148.91	0.25	9.998 4511	52.3	0 7 20.68
22	81	1 1 55.2	1 39.5	148.84	−0.15	9.998 5768	+52.3	0 3 24.77 23 59 28.86
23	82	2 1 26.4	1 10.6	148.76	−0.03	9.998 7024	52.3	23 55 32.96
24	83	3 0 55.7	0 39.8	148.68	+0.09	9.998 8279	52.2	23 51 37.05
25	84	4 0 23.1	0 7.0	148.60	+0.23	9.998 9531	+52.1	23 47 41.14
26	85	4 59 48.5	59 32.3	148.52	0.35	9.999 0781	52.0	23 43 45.23
27	86	5 59 11.9	58 55.6	148.43	0.47	9.999 2028	51.9	23 39 49.33
28	87	6 58 33.2	58 16.8	148.34	+0.59	9.999 3270	+51.7	23 35 53.42
29	88	7 57 52.4	57 35.8	148.25	0.67	9.999 4509	51.6	23 31 57.51
30	89	8 57 9.3	56 52.7	148.16	0.74	9.999 5745	51.4	23 28 1.60
31	90	9 56 24.1	56 7.4	148.07	0.77	9.999 6977	51.3	23 24 5.69
32	91	10 55 36.6	55 19.8	147.97	+0.78	9.999 8205	+51.1	23 20 9.79

Note.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
$-9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 45.8	14 47.3	54 5.22	+0.362	54 10.62	+0.540	3 13.9	1.74	4.5
2	14 49.4	14 52.1	54 18.22	0.728	54 28.12	0.923	3 57.1	1.86	5.5
3	14 55.4	14 59.4	54 40.38	1.122	54 55.04	1.322	4 43.6	2.01	6.5
4	15 4.1	15 9.3	55 12.09	+1.520	55 31.49	+1.712	5 33.9	2.17	7.5
5	15 15.2	15 21.7	55 53.14	1.894	56 16.87	2.059	6 27.9	2.31	8.5
6	15 28.7	15 36.1	56 42.46	2.202	57 9.60	2.316	7 24.6	2.40	9.5
7	15 43.8	15 51.7	57 37.90	+2.394	58 6.90	+2.431	8 22.4	2.41	10.5
8	15 59.6	16 7.5	58 36.05	2.418	59 4.72	2.351	9 19.7	2.36	11.5
9	16 15.0	16 21.9	59 32.23	2.224	59 57.85	2.036	10 15.2	2.27	12.5
10	16 28.2	16 33.6	60 20.87	+1.791	60 40.61	+1.491	11 8.6	2.19	13.5
11	16 37.9	16 41.0	60 56.46	1.143	61 7.90	+0.758	12 0.4	2.14	14.5
12	16 42.8	16 43.3	61 14.58	+0.353	61 16.35	−0.058	12 51.7	2.14	15.5
13	16 42.5	16 40.3	61 13.22	−0.461	61 5.37	−0.842	13 43.7	2.20	16.5
14	16 37.0	16 32.6	60 53.15	1.187	60 37.06	1.486	14 37.5	2.29	17.5
15	16 27.3	16 21.3	60 17.69	1.732	59 55.70	1.923	15 33.8	2.40	18.5
16	16 14.8	16 7.9	59 31.75	−2.059	59 6.49	−2.142	16 32.5	2.48	19.5
17	16 0.9	15 53.8	58 40.54	2.176	58 14.43	2.169	17 32.4	2.49	20.5
18	15 46.7	15 39.9	57 48.64	2.124	57 23.57	2.050	18 31.5	2.42	21.5
19	15 33.3	15 27.1	56 59.53	−1.954	56 36.74	−1.841	19 27.9	2.27	22.5
20	15 21.3	15 15.9	56 15.39	1.715	55 55.61	1.581	20 20.3	2.09	23.5
21	15 11.0	15 6.5	55 37.45	1.445	55 20.92	1.310	21 8.5	1.93	24.5
22	15 2.4	14 58.8	55 6.00	−1.177	54 52.67	−1.046	21 53.0	1.79	25.5
23	14 55.6	14 52.7	54 40.88	0.920	54 30.58	0.798	22 34.6	1.68	26.5
24	14 50.3	14 48.3	54 21.71	0.682	54 14.20	0.570	23 14.3	1.63	27.5
25	14 46.6	14 45.3	54 8.01	−0.461	54 3.12	−0.354	23 53.1	1.62	28.5
26	14 44.3	14 43.7	53 59.51	0.248	53 57.17	−0.142	☌	. .	29.5
27	14 43.4	14 43.4	53 56.12	−0.033	53 56.39	+0.079	0 32.1	1.65	0.7
28	14 43.9	14 44.7	53 58.03	+0.197	54 1.13	+0.321	1 12.4	1.71	1.7
29	14 46.0	14 47.7	54 5.75	0.451	54 11.97	0.588	1 54.8	1.82	2.7
30	14 49.8	14 52.5	54 19.89	0.733	54 29.60	0.886	2 40.0	1.95	3.7
31	14 55.6	14 59.3	54 41.18	1.045	54 54.70	1.209	3 28.6	2.09	4.7
32	15 3.5	15 8.3	55 10.22	+1.377	55 27.76	+1.545	4 20.5	2.22	5.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 1.					TUESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 42 13.61	1.8466	N. 14 33 6.9	12.439	0	3 16 9.47	2.0853	N. 23 13 29.8	8.883
1	1 44 4.52	1.8503	14 45 31.7	12.387	1	3 18 14.77	2.0913	23 22 19.8	8.784
2	1 45 55.65	1.8541	14 57 53.3	12.333	2	3 20 20.43	2.0973	23 31 3.9	8.686
3	1 47 47.01	1.8579	15 10 11.7	12.279	3	3 22 26.45	2.1033	23 39 42.1	8.586
4	1 49 38.60	1.8618	15 22 26.8	12.223	4	3 24 32.82	2.1093	23 48 14.2	8.484
5	1 51 30.43	1.8659	15 34 38.5	12.167	5	3 26 39.56	2.1153	23 56 40.2	8.382
6	1 53 22.51	1.8700	15 46 46.8	12.109	6	3 28 46.66	2.1213	24 5 0.0	8.278
7	1 55 14.83	1.8741	15 58 51.6	12.051	7	3 30 54.12	2.1273	24 13 13.6	8.174
8	1 57 7.40	1.8782	16 10 52.9	11.993	8	3 33 1.94	2.1334	24 21 20.9	8.068
9	1 59 0.21	1.8823	16 22 50.7	11.933	9	3 35 10.13	2.1395	24 29 21.8	7.962
10	2 0 53.28	1.8867	16 34 44.9	11.873	10	3 37 18.68	2.1456	24 37 16.3	7.854
11	2 2 46.61	1.8911	16 46 35.4	11.811	11	3 39 27.60	2.1517	24 45 4.3	7.745
12	2 4 40.21	1.8955	16 58 22.2	11.748	12	3 41 36.88	2.1578	24 52 45.7	7.635
13	2 6 34.07	1.8998	17 10 5.2	11.685	13	3 43 46.53	2.1638	25 0 20.5	7.524
14	2 8 28.19	1.9043	17 21 44.4	11.622	14	3 45 56.54	2.1699	25 7 48.6	7.412
15	2 10 22.59	1.9089	17 33 19.8	11.557	15	3 48 6.92	2.1760	25 15 9.9	7.298
16	2 12 17.26	1.9135	17 44 51.2	11.490	16	3 50 17.66	2.1821	25 22 24.4	7.184
17	2 14 12.21	1.9182	17 56 18.6	11.423	17	3 52 28.77	2.1881	25 29 32.0	7.069
18	2 16 7.44	1.9229	18 7 42.0	11.356	18	3 54 40.23	2.1942	25 36 32.7	6.953
19	2 18 2.96	1.9277	18 19 1.3	11.288	19	3 56 52.07	2.2003	25 43 26.4	6.835
20	2 19 58.76	1.9325	18 30 16.5	11.218	20	3 59 4.27	2.2063	25 50 12.9	6.716
21	2 21 54.86	1.9374	18 41 27.5	11.148	21	4 1 16.83	2.2124	25 56 52.3	6.597
22	2 23 51.25	1.9423	18 52 34.2	11.076	22	4 3 29.76	2.2185	26 3 24.5	6.476
23	2 25 47.93	1.9473	N. 19 3 36.6	11.003	23	4 5 43.05	2.2244	N. 26 9 49.4	6.353
	MONDAY 2.					WEDNESDAY 4.			
0	2 27 44.92	1.9523	N. 19 14 34.6	10.930	0	4 7 56.69	2.2304	N. 26 16 6.9	6.230
1	2 29 42.21	1.9574	19 25 28.2	10.857	1	4 10 10.70	2.2364	26 22 17.0	6.106
2	2 31 39.81	1.9625	19 36 17.4	10.782	2	4 12 25.06	2.2423	26 28 19.6	5.981
3	2 33 37.71	1.9676	19 47 2.0	10.706	3	4 14 39.78	2.2483	26 34 14.7	5.854
4	2 35 35.92	1.9728	19 57 42.1	10.629	4	4 16 54.85	2.2542	26 40 2.1	5.727
5	2 37 34.45	1.9782	20 8 17.5	10.551	5	4 19 10.28	2.2601	26 45 41.9	5.598
6	2 39 33.30	1.9835	20 18 48.2	10.472	6	4 21 26.06	2.2659	26 51 13.9	5.468
7	2 41 32.47	1.9888	20 29 14.1	10.393	7	4 23 42.19	2.2717	26 56 38.1	5.338
8	2 43 31.96	1.9942	20 39 35.3	10.313	8	4 25 58.66	2.2774	27 1 54.4	5.206
9	2 45 31.77	1.9996	20 49 51.6	10.230	9	4 28 15.48	2.2832	27 7 2.8	5.074
10	2 47 31.91	2.0052	21 0 2.9	10.147	10	4 30 32.64	2.2888	27 12 3.3	4.940
11	2 49 32.39	2.0107	21 10 9.2	10.063	11	4 32 50.14	2.2945	27 16 55.6	4.804
12	2 51 33.19	2.0162	21 20 10.5	9.979	12	4 35 7.98	2.3001	27 21 39.8	4.668
13	2 53 34.33	2.0218	21 30 6.7	9.893	13	4 37 26.15	2.3057	27 26 15.8	4.531
14	2 55 35.80	2.0273	21 39 57.7	9.807	14	4 39 44.66	2.3113	27 30 43.5	4.393
15	2 57 37.61	2.0330	21 49 43.5	9.719	15	4 42 3.50	2.3167	27 35 2.9	4.254
16	2 59 39.76	2.0388	21 59 24.0	9.630	16	4 44 22.66	2.3220	27 39 14.0	4.114
17	3 1 42.26	2.0445	22 8 59.1	9.540	17	4 46 42.14	2.3274	27 43 16.6	3.973
18	3 3 45.10	2.0502	22 18 28.8	9.449	18	4 49 1.95	2.3328	27 47 10.7	3.830
19	3 5 48.28	2.0560	22 27 53.0	9.358	19	4 51 22.07	2.3379	27 50 56.2	3.687
20	3 7 51.82	2.0618	22 37 11.7	9.265	20	4 53 42.50	2.3431	27 54 33.1	3.543
21	3 9 55.70	2.0677	22 46 24.8	9.171	21	4 56 3.24	2.3482	27 58 1.3	3.398
22	3 11 59.94	2.0736	22 55 32.2	9.076	22	4 58 24.28	2.3532	28 1 20.8	3.252
23	3 14 4.53	2.0794	23 4 33.9	8.980	23	5 0 45.62	2.3582	28 4 31.5	3.104
24	3 16 9.47	2.0853	N. 23 13 29.8	8.883	24	5 3 7.26	2.3631	N. 28 7 33.3	2.956

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 5.					SATURDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 3 7.26	2.3631	N. 28 7 33.3	2.956	0	7 0 27.18	2.4850	N. 27 24 28.7	4.947
1	5 5 29.19	2.3679	28 10 26.2	2.807	1	7 2 56.28	2.4848	27 19 26.7	5.119
2	5 7 51.41	2.3728	28 13 10.1	2.657	2	7 5 25.36	2.4845	27 14 14.4	5.291
3	5 10 13.92	2.3774	28 15 45.0	2.507	3	7 7 54.42	2.4842	27 8 51.8	5.463
4	5 12 36.70	2.3820	28 18 10.9	2.355	4	7 10 23.46	2.4838	27 3 18.9	5.634
5	5 14 59.76	2.3865	28 20 27.6	2.202	5	7 12 52.47	2.4832	26 57 35.7	5.807
6	5 17 23.08	2.3909	28 22 35.1	2.048	6	7 15 21.44	2.4824	26 51 42.1	5.978
7	5 19 46.67	2.3953	28 24 33.4	1.894	7	7 17 50.36	2.4816	26 45 38.3	6.149
8	5 22 10.51	2.3995	28 26 22.4	1.738	8	7 20 19.23	2.4808	26 39 24.2	6.320
9	5 24 34.61	2.4038	28 28 2.0	1.582	9	7 22 48.05	2.4798	26 32 59.9	6.490
10	5 26 58.96	2.4078	28 29 32.2	1.426	10	7 25 16.80	2.4787	26 26 25.4	6.661
11	5 29 23.55	2.4118	28 30 53.1	1.268	11	7 27 45.49	2.4775	26 19 40.6	6.831
12	5 31 48.37	2.4157	28 32 4.4	1.109	12	7 30 14.10	2.4762	26 12 45.7	7.000
13	5 34 13.43	2.4196	28 33 6.2	0.950	13	7 32 42.63	2.4748	26 5 40.6	7.169
14	5 36 38.72	2.4233	28 33 58.4	0.790	14	7 35 11.07	2.4733	25 58 25.4	7.338
15	5 39 4.22	2.4268	28 34 41.0	0.629	15	7 37 39.43	2.4718	25 51 0.1	7.506
16	5 41 29.94	2.4304	28 35 13.9	0.467	16	7 40 7.69	2.4702	25 43 24.7	7.673
17	5 43 55.87	2.4338	28 35 37.0	0.305	17	7 42 35.85	2.4684	25 35 39.3	7.841
18	5 46 21.99	2.4370	28 35 50.5	+0.142	18	7 45 3.90	2.4665	25 27 43.8	8.008
19	5 48 48.31	2.4403	28 35 54.1	−0.022	19	7 47 31.83	2.4646	25 19 38.4	8.173
20	5 51 14.83	2.4435	28 35 47.9	0.185	20	7 49 59.65	2.4627	25 11 23.0	8.339
21	5 53 41.53	2.4464	28 35 31.9	0.350	21	7 52 27.35	2.4607	25 2 57.7	8.503
22	5 56 8.40	2.4493	28 35 5.9	0.515	22	7 54 54.93	2.4585	24 54 22.6	8.668
23	5 58 35.44	2.4521	N. 28 34 30.1	0.681	23	7 57 22.37	2.4563	N. 24 45 37.6	8.831
	FRIDAY 6.					SUNDAY 8.			
0	6 1 2.65	2.4547	N. 28 33 44.2	0.848	0	7 59 49.68	2.4540	N. 24 36 42.9	8.993
1	6 3 30.01	2.4573	28 32 48.3	1.015	1	8 2 16.85	2.4517	24 27 38.4	9.156
2	6 5 57.53	2.4598	28 31 42.4	1.182	2	8 4 43.88	2.4493	24 18 24.2	9.317
3	6 8 25.19	2.4622	28 30 26.5	1.350	3	8 7 10.76	2.4468	24 9 0.4	9.477
4	6 10 52.99	2.4643	28 29 0.4	1.519	4	8 9 37.49	2.4442	23 59 27.0	9.636
5	6 13 20.91	2.4664	28 27 24.2	1.688	5	8 12 4.06	2.4416	23 49 44.1	9.795
6	6 15 48.96	2.4685	28 25 37.8	1.858	6	8 14 30.48	2.4389	23 39 51.6	9.953
7	6 18 17.13	2.4704	28 23 41.3	2.027	7	8 16 56.73	2.4362	23 29 49.7	10.110
8	6 20 45.41	2.4722	28 21 34.6	2.197	8	8 19 22.82	2.4334	23 19 38.4	10.266
9	6 23 13.79	2.4738	28 19 17.7	2.367	9	8 21 48.74	2.4306	23 9 17.8	10.421
10	6 25 42.26	2.4753	28 16 50.6	2.538	10	8 24 14.49	2.4278	22 58 47.9	10.575
11	6 28 10.83	2.4768	28 14 13.2	2.709	11	8 26 40.07	2.4248	22 48 8.8	10.728
12	6 30 39.48	2.4782	28 11 25.5	2.881	12	8 29 5.47	2.4218	22 37 20.6	10.880
13	6 33 8.21	2.4793	28 8 27.5	3.052	13	8 31 30.69	2.4188	22 26 23.2	11.031
14	6 35 37.00	2.4803	28 5 19.3	3.223	14	8 33 55.73	2.4158	22 15 16.9	11.180
15	6 38 5.85	2.4813	28 2 0.8	3.395	15	8 36 20.58	2.4126	22 4 1.6	11.329
16	6 40 34.76	2.4822	27 58 31.9	3.568	16	8 38 45.24	2.4095	21 52 37.4	11.478
17	6 43 3.71	2.4829	27 54 52.7	3.739	17	8 41 9.72	2.4064	21 41 4.3	11.624
18	6 45 32.71	2.4836	27 51 3.2	3.912	18	8 43 34.01	2.4032	21 29 22.5	11.769
19	6 48 1.74	2.4841	27 47 3.3	4.084	19	8 45 58.10	2.3999	21 17 32.0	11.913
20	6 50 30.80	2.4845	27 42 53.1	4.257	20	8 48 22.00	2.3968	21 5 32.9	12.057
21	6 52 59.88	2.4848	27 38 32.5	4.429	21	8 50 45.71	2.3935	20 53 25.2	12.199
22	6 55 28.98	2.4850	27 34 1.6	4.602	22	8 53 9.22	2.3902	20 41 9.0	12.339
23	6 57 58.08	2.4850	27 29 20.3	4.774	23	8 55 32.53	2.3869	20 28 44.5	12.478
24	7 0 27.18	2.4850	N. 27 24 28.7	4.947	24	8 57 55.65	2.3836	N. 20 16 11.6	12.617

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 9.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	8 57 55.65	2.3836	N. 20 16 11.6	12.617
1	9 0 18.56	2.3803	20 3 30.4	12.754
2	9 2 41.28	2.3769	19 50 41.1	12.889
3	9 5 3.79	2.3736	19 37 43.7	13.023
4	9 7 26.11	2.3703	19 24 38.3	13.156
5	9 9 48.22	2.3668	19 11 25.0	13.288
6	9 12 10.13	2.3635	18 58 3.8	13.418
7	9 14 31.84	2.3602	18 44 34.9	13.546
8	9 16 53.35	2.3568	18 30 58.3	13.673
9	9 19 14.66	2.3535	18 17 14.1	13.799
10	9 21 35.77	2.3501	18 3 22.4	13.923
11	9 23 56.67	2.3468	17 49 23.3	14.046
12	9 26 17.38	2.3435	17 35 16.9	14.167
13	9 28 37.89	2.3402	17 21 3.3	14.287
14	9 30 58.20	2.3368	17 6 42.5	14.405
15	9 33 18.31	2.3335	16 52 14.7	14.522
16	9 35 38.22	2.3303	16 37 39.9	14.637
17	9 37 57.94	2.3271	16 22 58.3	14.750
18	9 40 17.47	2.3238	16 8 9.9	14.863
19	9 42 36.80	2.3207	15 53 14.8	14.973
20	9 44 55.95	2.3175	15 38 13.2	15.081
21	9 47 14.90	2.3143	15 23 5.1	15.188
22	9 49 33.67	2.3113	15 7 50.7	15.293
23	9 51 52.26	2.3083	N. 14 52 30.0	15.397

TUESDAY 10.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	9 54 10.66	2.3052	N. 14 37 3.1	15.498
1	9 56 28.88	2.3022	14 21 30.2	15.598
2	9 58 46.92	2.2992	14 5 51.3	15.698
3	10 1 4.78	2.2963	13 50 6.5	15.794
4	10 3 22.47	2.2934	13 34 16.0	15.888
5	10 5 39.99	2.2906	13 18 19.9	15.982
6	10 7 57.34	2.2878	13 2 18.2	16.072
7	10 10 14.52	2.2850	12 46 11.1	16.162
8	10 12 31.54	2.2823	12 29 58.6	16.251
9	10 14 48.40	2.2797	12 13 41.0	16.337
10	10 17 5.10	2.2771	11 57 18.2	16.422
11	10 19 21.65	2.2745	11 40 50.4	16.504
12	10 21 38.04	2.2720	11 24 17.7	16.584
13	10 23 54.29	2.2696	11 7 40.3	16.663
14	10 26 10.39	2.2672	10 50 58.2	16.740
15	10 28 26.35	2.2648	10 34 11.5	16.815
16	10 30 42.17	2.2626	10 17 20.4	16.888
17	10 32 57.86	2.2604	10 0 24.9	16.960
18	10 35 13.42	2.2583	9 43 25.2	17.028
19	10 37 28.85	2.2562	9 26 21.5	17.096
20	10 39 44.16	2.2541	9 9 13.7	17.163
21	10 41 59.34	2.2521	8 52 2.0	17.226
22	10 44 14.41	2.2503	8 34 46.6	17.287
23	10 46 29.37	2.2484	8 17 27.6	17.347
24	10 48 44.22	2.2466	N. 8 0 5.0	17.405

WEDNESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	10 48 44.22	2.2466	N. 8 0 5.0	17.405
1	10 50 58.96	2.2449	7 42 39.0	17.461
2	10 53 13.61	2.2433	7 25 9.7	17.514
3	10 55 28.16	2.2417	7 7 37.3	17.566
4	10 57 42.61	2.2402	6 50 1.8	17.616
5	10 59 56.98	2.2388	6 32 23.4	17.663
6	11 2 11.27	2.2374	6 14 42.2	17.710
7	11 4 25.47	2.2361	5 56 58.2	17.754
8	11 6 39.60	2.2349	5 39 11.7	17.795
9	11 8 53.66	2.2338	5 21 22.8	17.835
10	11 11 7.66	2.2328	5 3 31.5	17.873
11	11 13 21.59	2.2317	4 45 38.0	17.909
12	11 15 35.46	2.2308	4 27 42.4	17.943
13	11 17 49.28	2.2299	4 9 44.8	17.975
14	11 20 3.05	2.2293	3 51 45.4	18.004
15	11 22 16.79	2.2286	3 33 44.3	18.032
16	11 24 30.48	2.2278	3 15 41.6	18.058
17	11 26 44.13	2.2273	2 57 37.4	18.081
18	11 28 57.76	2.2269	2 39 31.9	18.103
19	11 31 11.36	2.2266	2 21 25.1	18.123
20	11 33 24.95	2.2263	2 3 17.2	18.140
21	11 35 38.52	2.2260	1 45 8.3	18.155
22	11 37 52.07	2.2258	1 26 58.6	18.168
23	11 40 5.62	2.2258	N. 1 8 48.2	18.178

THURSDAY 12.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	11 42 19.17	2.2258	N. 0 50 37.2	18.188
1	11 44 32.72	2.2259	0 32 25.7	18.195
2	11 46 46.28	2.2261	N. 0 14 13.8	18.201
3	11 48 59.85	2.2263	S. 0 3 58.4	18.203
4	11 51 13.44	2.2268	0 22 10.6	18.203
5	11 53 27.06	2.2272	0 40 22.8	18.202
6	11 55 40.70	2.2276	0 58 34.8	18.198
7	11 57 54.37	2.2282	1 16 46.6	18.193
8	12 0 8.08	2.2289	1 34 58.0	18.186
9	12 2 21.84	2.2297	1 53 8.9	18.176
10	12 4 35.64	2.2304	2 11 19.1	18.164
11	12 6 49.49	2.2313	2 29 28.6	18.150
12	12 9 3.40	2.2323	2 47 37.1	18.133
13	12 11 17.37	2.2333	3 5 44.6	18.116
14	12 13 31.40	2.2345	3 23 51.0	18.097
15	12 15 45.51	2.2358	3 41 56.2	18.074
16	12 17 59.69	2.2370	3 59 59.9	18.049
17	12 20 13.95	2.2384	4 18 2.1	18.023
18	12 22 28.30	2.2398	4 36 2.7	17.995
19	12 24 42.73	2.2413	4 54 1.5	17.964
20	12 26 57.26	2.2430	5 11 58.4	17.932
21	12 29 11.89	2.2447	5 29 53.3	17.897
22	12 31 26.62	2.2464	5 47 46.0	17.860
23	12 33 41.46	2.2483	6 5 36.5	17.821
24	12 35 56.41	2.2502	S. 6 23 24.5	17.780

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 13.

	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	12 35 56.41	2.2502	S. 6 23 24.5	17.780
1	12 38 11.48	2.2522	6 41 10.1	17.738
2	12 40 26.67	2.2542	6 58 53.0	17.693
3	12 42 41.98	2.2563	7 16 33.2	17.646
4	12 44 57.42	2.2585	7 34 10.5	17.596
5	12 47 13.00	2.2608	7 51 44.7	17.544
6	12 49 28.72	2.2632	8 9 15.8	17.492
7	12 51 44.58	2.2655	8 26 43.7	17.437
8	12 54 0.58	2.2680	8 44 8.2	17.380
9	12 56 16.74	2.2706	9 1 29.3	17.321
10	12 58 33.05	2.2732	9 18 46.7	17.258
11	13 0 49.52	2.2759	9 36 0.3	17.195
12	13 3 6.16	2.2787	9 53 10.1	17.130
13	13 5 22.96	2.2814	10 10 15.9	17.063
14	13 7 39.93	2.2843	10 27 17.6	16.993
15	13 9 57.08	2.2873	10 44 15.1	16.922
16	13 12 14.41	2.2903	11 1 8.2	16.848
17	13 14 31.92	2.2934	11 17 56.8	16.773
18	13 16 49.61	2.2964	11 34 40.9	16.696
19	13 19 7.49	2.2997	11 51 20.3	16.617
20	13 21 25.57	2.3029	12 7 54.9	16.536
21	13 23 43.84	2.3062	12 24 24.6	16.453
22	13 26 2.31	2.3095	12 40 49.2	16.367
23	13 28 20.98	2.3129	S. 12 57 8.6	16.280

SATURDAY 14.

	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	13 30 39.86	2.3163	S. 13 13 22.8	16.192
1	13 32 58.94	2.3198	13 29 31.6	16.101
2	13 35 18.24	2.3234	13 45 34.9	16.008
3	13 37 37.75	2.3270	14 1 32.5	15.913
4	13 39 57.48	2.3307	14 17 24.4	15.817
5	13 42 17.43	2.3343	14 33 10.5	15.719
6	13 44 37.60	2.3380	14 48 50.7	15.619
7	13 46 57.99	2.3418	15 4 24.8	15.517
8	13 49 18.61	2.3456	15 19 52.7	15.413
9	13 51 39.46	2.3493	15 35 14.3	15.308
10	13 54 0.53	2.3532	15 50 29.6	15.201
11	13 56 21.84	2.3572	16 5 38.4	15.091
12	13 58 43.39	2.3611	16 20 40.5	14.979
13	14 1 5.17	2.3650	16 35 35.9	14.867
14	14 3 27.19	2.3690	16 50 24.5	14.753
15	14 5 49.45	2.3730	17 5 6.2	14.636
16	14 8 11.95	2.3770	17 19 40.8	14.518
17	14 10 34.69	2.3810	17 34 8.3	14.398
18	14 12 57.67	2.3851	17 48 28.6	14.278
19	14 15 20.90	2.3893	18 2 41.6	14.154
20	14 17 44.38	2.3933	18 16 47.1	14.029
21	14 20 8.10	2.3974	18 30 45.1	13.903
22	14 22 32.07	2.4015	18 44 35.4	13.775
23	14 24 56.28	2.4056	18 58 18.1	13.646
24	14 27 20.74	2.4098	S. 19 11 52.9	13.514

SUNDAY 15.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	14 27 20.74	2.4098	S. 19 11 52.9	13.514
1	14 29 45.45	2.4138	19 25 19.8	13.382
2	14 32 10.40	2.4179	19 38 38.7	13.248
3	14 34 35.60	2.4221	19 51 49.5	13.111
4	14 37 1.05	2.4262	20 4 52.0	12.973
5	14 39 26.74	2.4303	20 17 46.3	12.835
6	14 41 52.68	2.4343	20 30 32.2	12.694
7	14 44 18.86	2.4383	20 43 9.6	12.553
8	14 46 45.28	2.4424	20 55 38.5	12.409
9	14 49 11.95	2.4465	21 7 58.7	12.264
10	14 51 38.86	2.4505	21 20 10.2	12.118
11	14 54 6.01	2.4544	21 32 12.9	11.971
12	14 56 33.39	2.4583	21 44 6.7	11.822
13	14 59 1.01	2.4623	21 55 51.5	11.671
14	15 1 28.87	2.4663	22 7 27.2	11.519
15	15 3 56.96	2.4700	22 18 53.8	11.367
16	15 6 25.27	2.4738	22 30 11.2	11.213
17	15 8 53.82	2.4777	22 41 19.4	11.058
18	15 11 22.59	2.4813	22 52 18.1	10.900
19	15 13 51.58	2.4850	23 3 7.4	10.743
20	15 16 20.79	2.4887	23 13 47.2	10.584
21	15 18 50.22	2.4923	23 24 17.5	10.424
22	15 21 19.86	2.4958	23 34 38.1	10.263
23	15 23 49.71	2.4992	S. 23 44 49.0	10.100

MONDAY 16.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	15 26 19.76	2.5025	S. 23 54 50.1	9.936
1	15 28 50.01	2.5059	24 4 41.3	9.772
2	15 31 20.47	2.5093	24 14 22.7	9.607
3	15 33 51.12	2.5124	24 23 54.1	9.440
4	15 36 21.96	2.5155	24 33 15.5	9.273
5	15 38 52.98	2.5186	24 42 26.8	9.103
6	15 41 24.19	2.5216	24 51 27.9	8.933
7	15 43 55.57	2.5244	25 0 18.8	8.763
8	15 46 27.12	2.5273	25 8 59.5	8.593
9	15 48 58.84	2.5300	25 17 29.9	8.421
10	15 51 30.72	2.5327	25 25 50.0	8.248
11	15 54 2.76	2.5352	25 33 59.7	8.074
12	15 56 34.94	2.5376	25 41 58.9	7.900
13	15 59 7.27	2.5400	25 49 47.7	7.725
14	16 1 39.74	2.5423	25 57 25.9	7.549
15	16 4 12.34	2.5444	26 4 53.6	7.373
16	16 6 45.07	2.5465	26 12 10.6	7.195
17	16 9 17.92	2.5484	26 19 17.0	7.018
18	16 11 50.88	2.5503	26 26 12.8	6.840
19	16 14 23.95	2.5520	26 32 57.8	6.661
20	16 16 57.12	2.5537	26 39 32.1	6.483
21	16 19 30.39	2.5552	26 45 55.7	6.303
22	16 22 3.74	2.5566	26 52 8.4	6.123
23	16 24 37.18	2.5579	26 58 10.4	5.943
24	16 27 10.69	2.5590	S. 27 4 1.5	5.761

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 17.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	16 27 10.69	2.5590	S. 27 4 1.5	5.761
1	16 29 44.26	2.5601	27 9 41.7	5.579
2	16 32 17.90	2.5611	27 15 11.0	5.398
3	16 34 51.59	2.5618	27 20 29.5	5.217
4	16 37 25.32	2.5625	27 25 37.0	5.034
5	16 39 59.09	2.5631	27 30 33.6	4.853
6	16 42 32.89	2.5635	27 35 19.3	4.669
7	16 45 6.71	2.5638	27 39 53.9	4.486
8	16 47 40.54	2.5639	27 44 17.6	4.304
9	16 50 14.38	2.5640	27 48 30.4	4.122
10	16 52 48.22	2.5639	27 52 32.2	3.938
11	16 55 22.05	2.5638	27 56 23.0	3.756
12	16 57 55.87	2.5634	28 0 2.9	3.573
13	17 0 29.66	2.5629	28 3 31.7	3.389
14	17 3 3.42	2.5623	28 6 49.6	3.207
15	17 5 37.13	2.5614	28 9 56.6	3.025
16	17 8 10.79	2.5606	28 12 52.6	2.842
17	17 10 44.40	2.5596	28 15 37.6	2.660
18	17 13 17.94	2.5584	28 18 11.8	2.478
19	17 15 51.41	2.5572	28 20 35.0	2.296
20	17 18 24.80	2.5557	28 22 47.3	2.114
21	17 20 58.09	2.5541	28 24 48.7	1.933
22	17 23 31.29	2.5525	28 26 39.3	1.753
23	17 26 4.39	2.5507	S. 28 28 19.0	1.572

WEDNESDAY 18.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	17 28 37.37	2.5487	S. 28 29 47.9	1.392
1	17 31 10.23	2.5466	28 31 6.0	1.212
2	17 33 42.96	2.5443	28 32 13.3	1.033
3	17 36 15.55	2.5420	28 33 9.9	0.854
4	17 38 48.00	2.5395	28 33 55.8	0.676
5	17 41 20.29	2.5368	28 34 31.0	0.498
6	17 43 52.42	2.5341	28 34 55.5	0.320
7	17 46 24.38	2.5312	28 35 9.4	−0.144
8	17 48 56.16	2.5283	28 35 12.8	+0.032
9	17 51 27.77	2.5252	28 35 5.6	0.208
10	17 53 59.18	2.5218	28 34 47.9	0.383
11	17 56 30.39	2.5185	28 34 19.7	0.557
12	17 59 1.40	2.5150	28 33 41.1	0.730
13	18 1 32.19	2.5113	28 32 52.1	0.903
14	18 4 2.76	2.5076	28 31 52.8	1.074
15	18 6 33.10	2.5038	28 30 43.2	1.246
16	18 9 3.21	2.4998	28 29 23.3	1.416
17	18 11 33.07	2.4957	28 27 53.3	1.585
18	18 14 2.69	2.4915	28 26 13.1	1.754
19	18 16 32.05	2.4872	28 24 22.8	1.922
20	18 19 1.15	2.4828	28 22 22.5	2.088
21	18 21 29.98	2.4783	28 20 12.3	2.253
22	18 23 58.54	2.4738	28 17 52.1	2.418
23	18 26 26.82	2.4690	28 15 22.1	2.583
24	18 28 54.82	2.4642	S. 28 12 42.2	2.746

THURSDAY 19.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min
	h m s	s	° ′ ″	″
0	18 28 54.82	2.4642	S. 28 12 42.2	2.74
1	18 31 22.52	2.4592	28 9 52.6	2.90
2	18 33 49.92	2.4542	28 6 53.3	3.06
3	18 36 17.02	2.4491	28 3 44.4	3.22
4	18 38 43.81	2.4438	28 0 25.9	3.38
5	18 41 10.28	2.4386	27 56 58.0	3.54
6	18 43 36.44	2.4333	27 53 20.6	3.70
7	18 46 2.27	2.4278	27 49 33.8	3.85
8	18 48 27.77	2.4223	27 45 37.7	4.01
9	18 50 52.94	2.4167	27 41 32.4	4.16
10	18 53 17.77	2.4110	27 37 17.9	4.31
11	18 55 42.26	2.4053	27 32 54.3	4.46
12	18 58 6.40	2.3994	27 28 21.7	4.61
13	19 0 30.19	2.3935	27 23 40.1	4.76
14	19 2 53.62	2.3876	27 18 49.6	4.91
15	19 5 16.70	2.3816	27 13 50.3	5.06
16	19 7 39.41	2.3755	27 8 42.3	5.20
17	19 10 1.76	2.3693	27 3 25.6	5.35
18	19 12 23.73	2.3631	26 58 0.2	5.49
19	19 14 45.33	2.3569	26 52 26.4	5.63
20	19 17 6.56	2.3507	26 46 44.1	5.77
21	19 19 27.41	2.3443	26 40 53.3	5.915
22	19 21 47.88	2.3379	26 34 54.3	6.053
23	19 24 7.96	2.3315	S. 26 28 47.0	6.189

FRIDAY 20.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min
0	19 26 27.66	2.3251	S. 26 22 31.6	6.324
1	19 28 46.97	2.3186	26 16 8.1	6.458
2	19 31 5.89	2.3120	26 9 36.6	6.591
3	19 33 24.41	2.3054	26 2 57.2	6.723
4	19 35 42.54	2.2988	25 56 9.9	6.853
5	19 38 0.27	2.2923	25 49 14.9	6.981
6	19 40 17.61	2.2857	25 42 12.2	7.109
7	19 42 34.55	2.2789	25 35 1.8	7.236
8	19 44 51.08	2.2723	25 27 43.9	7.361
9	19 47 7.22	2.2656	25 20 18.5	7.485
10	19 49 22.95	2.2588	25 12 45.7	7.607
11	19 51 38.28	2.2521	25 5 5.6	7.728
12	19 53 53.20	2.2453	24 57 18.3	7.848
13	19 56 7.72	2.2387	24 49 23.8	7.968
14	19 58 21.84	2.2319	24 41 22.2	8.084
15	20 0 35.55	2.2252	24 33 13.7	8.200
16	20 2 48.86	2.2184	24 24 58.2	8.315
17	20 5 1.76	2.2117	24 16 35.9	8.428
18	20 7 14.26	2.2050	24 8 6.8	8.541
19	20 9 26.36	2.1983	23 59 31.0	8.653
20	20 11 38.05	2.1914	23 50 48.5	8.762
21	20 13 49.33	2.1847	23 41 59.6	8.869
22	20 16 0.21	2.1780	23 33 4.2	8.977
23	20 18 10.69	2.1713	23 24 2.4	9.083
24	20 20 20.77	2.1647	S. 23 14 54.2	9.188

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 21.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	20 20 20.77	2.1647	S. 23 14 54.2	9.188
1	20 22 30.45	2.1580	23 5 39.9	9.290
2	20 24 39.73	2.1513	22 56 19.4	9.393
3	20 26 48.61	2.1447	22 46 52.8	9.493
4	20 28 57.09	2.1380	22 37 20.2	9.593
5	20 31 5.17	2.1314	22 27 41.7	9.691
6	20 33 12.86	2.1249	22 17 57.3	9.788
7	20 35 20.16	2.1184	22 8 7.1	9.884
8	20 37 27.07	2.1119	21 58 11.2	9.978
9	20 39 33.59	2.1054	21 48 9.7	10.071
10	20 41 39.72	2.0990	21 38 2.7	10.163
11	20 43 45.47	2.0926	21 27 50.1	10.255
12	20 45 50.83	2.0862	21 17 32.1	10.344
13	20 47 55.81	2.0798	21 7 8.8	10.433
14	20 50 0.41	2.0735	20 56 40.2	10.520
15	20 52 4.63	2.0673	20 46 6.4	10.606
16	20 54 8.48	2.0610	20 35 27.5	10.690
17	20 56 11.95	2.0548	20 24 43.6	10.773
18	20 58 15.05	2.0487	20 13 54.7	10.857
19	21 0 17.79	2.0426	20 3 0.8	10.938
20	21 2 20.16	2.0365	19 52 2.1	11.018
21	21 4 22.17	2.0305	19 40 58.7	11.097
22	21 6 23.82	2.0245	19 29 50.5	11.175
23	21 8 25.11	2.0186	S. 19 18 37.7	11.251

SUNDAY 22.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	21 10 26.05	2.0128	S. 19 7 20.4	11.326
1	21 12 26.64	2.0069	18 55 58.6	11.401
2	21 14 26.88	2.0011	18 44 32.3	11.474
3	21 16 26.77	1.9953	18 33 1.7	11.546
4	21 18 26.32	1.9898	18 21 26.8	11.617
5	21 20 25.54	1.9842	18 9 47.7	11.687
6	21 22 24.42	1.9785	17 58 4.4	11.756
7	21 24 22.96	1.9730	17 46 17.0	11.823
8	21 26 21.18	1.9676	17 34 25.6	11.890
9	21 28 19.07	1.9622	17 22 30.2	11.956
10	21 30 16.64	1.9568	17 10 30.9	12.020
11	21 32 13.88	1.9514	16 58 27.8	12.083
12	21 34 10.81	1.9463	16 46 20.9	12.146
13	21 36 7.43	1.9411	16 34 10.3	12.207
14	21 38 3.74	1.9359	16 21 56.1	12.267
15	21 39 59.74	1.9309	16 9 38.3	12.327
16	21 41 55.45	1.9259	15 57 16.9	12.385
17	21 43 50.85	1.9209	15 44 52.1	12.442
18	21 45 45.96	1.9161	15 32 23.9	12.498
19	21 47 40.78	1.9113	15 19 52.4	12.553
20	21 49 35.31	1.9065	15 7 17.6	12.607
21	21 51 29.56	1.9018	14 54 39.6	12.659
22	21 53 23.53	1.8972	14 41 58.5	12.711
23	21 55 17.22	1.8926	14 29 14.3	12.763
24	21 57 10.64	1.8881	S. 14 16 27.0	12.813

MONDAY 23.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	21 57 10.64	1.8881	S. 14 16 27.0	12.813
1	21 59 3.79	1.8837	14 3 36.8	12,862
2	22 0 56.68	1.8793	13 50 43.6	12.910
3	22 2 49.31	1.8749	13 37 47.6	12.957
4	22 4 41.67	1.8707	13 24 48.8	13.003
5	22 6 33.79	1.8665	13 11 47.3	13.048
6	22 8 25.65	1.8623	12 58 43.1	13.093
7	22 10 17.27	1.8583	12 45 36.2	13.136
8	22 12 8.65	1.8543	12 32 26.8	13.178
9	22 13 59.79	1.8504	12 19 14.9	13.219
10	22 15 50.70	1.8465	12 6 0.5	13.260
11	22 17 41.37	1.8427	11 52 43.7	13.299
12	22 19 31.82	1.8390	11 39 24.6	13.338
13	22 21 22.05	1.8353	11 26 3.2	13.375
14	22 23 12.06	1.8318	11 12 39.6	13.413
15	22 25 1.86	1.8283	10 59 13.7	13.449
16	22 26 51.45	1.8248	10 45 45.7	13.483
17	22 28 40.83	1.8213	10 32 15.7	13.518
18	22 30 30.01	1.8181	10 18 43.6	13.551
19	22 32 19.00	1.8148	10 5 9.6	13.583
20	22 34 7.79	1.8116	9 51 33.7	13.614
21	22 35 56.39	1.8084	9 37 55.9	13.646
22	22 37 44.80	1.8053	9 24 16.2	13.676
23	22 39 33.03	1.8024	S. 9 10 34.8	13.704

TUESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	22 41 21.09	1.7996	S. 8 56 51.7	13.732
1	22 43 8.98	1.7967	8 43 6.9	13.759
2	22 44 56.69	1.7938	8 29 20.6	13.785
3	22 46 44.24	1.7911	8 15 32.7	13.811
4	22 48 31.62	1.7884	8 1 43.3	13.836
5	22 50 18.85	1.7859	7 47 52.4	13.860
6	22 52 5.93	1.7834	7 34 0.1	13.883
7	22 53 52.86	1.7809	7 20 6.4	13.905
8	22 55 39.64	1.7785	7 6 11.5	13.926
9	22 57 26.28	1.7762	6 52 15.3	13.947
10	22 59 12.78	1.7739	6 38 17.9	13.967
11	23 0 59.15	1.7718	6 24 19.3	13.986
12	23 2 45.39	1.7697	6 10 19.6	14.004
13	23 4 31.51	1.7677	5 56 18.8	14.021
14	23 6 17.51	1.7657	5 42 17.1	14.037
15	23 8 3.39	1.7638	5 28 14.4	14.053
16	23 9 49.16	1.7619	5 14 10.8	14.068
17	23 11 34.82	1.7601	5 0 6.3	14.082
18	23 13 20.37	1.7583	4 46 1.0	14.095
19	23 15 5.82	1.7568	4 31 54.9	14.108
20	23 16 51.18	1.7553	4 17 48.1	14.119
21	23 18 36.45	1.7538	4 3 40.6	14.129
22	23 20 21.63	1.7523	3 49 32.6	14.139
23	23 22 6.72	1.7509	3 35 23.9	14.149
24	23 23 51.74	1.7497	S. 3 21 14.7	14.158

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	23 23 51.74	1.7497	S. 3 21 14.7	14.158
1	23 25 36.68	1.7484	3 7 5.0	14.165
2	23 27 21.55	1.7473	2 52 54.9	14.172
3	23 29 6.35	1.7462	2 38 44.4	14.178
4	23 30 51.09	1.7452	2 24 33.5	14.184
5	23 32 35.77	1.7442	2 10 22.3	14.188
6	23 34 20.39	1.7433	1 56 10.9	14.193
7	23 36 4.96	1.7424	1 41 59.2	14.196
8	23 37 49.48	1.7417	1 27 47.4	14.198
9	23 39 33.96	1.7410	1 13 35.5	14.199
10	23 41 18.40	1.7403	0 59 23.5	14.200
11	23 43 2.80	1.7398	0 45 11.5	14.200
12	23 44 47.17	1.7393	0 30 59.5	14.200
13	23 46 31.51	1.7388	0 16 47.5	14.198
14	23 48 15.83	1.7385	S. 0 2 35.7	14.195
15	23 50 0.13	1.7383	N. 0 11 35.9	14.193
16	23 51 44.42	1.7380	0 25 47.4	14.189
17	23 53 28.69	1.7378	0 39 58.6	14.184
18	23 55 12.95	1.7377	0 54 9.5	14.179
19	23 56 57.21	1.7377	1 8 20.1	14.173
20	23 58 41.47	1.7378	1 22 30.3	14.167
21	0 0 25.74	1.7378	1 36 40.1	14.159
22	0 2 10.01	1.7380	1 50 49.4	14.150
23	0 3 54.30	1.7383	N. 2 4 58.1	14.141

THURSDAY 26.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	0 5 38.60	1.7385	N. 2 19 6.3	14.132
1	0 7 22.92	1.7389	2 33 13.9	14.121
2	0 9 7.27	1.7393	2 47 20.8	14.109
3	0 10 51.64	1.7398	3 1 27.0	14.098
4	0 12 36.04	1.7403	3 15 32.5	14.085
5	0 14 20.48	1.7410	3 29 37.2	14.072
6	0 16 4.96	1.7418	3 43 41.1	14.058
7	0 17 49.49	1.7425	3 57 44.1	14.042
8	0 19 34.06	1.7433	4 11 46.1	14.026
9	0 21 18.68	1.7441	4 25 47.2	14.009
10	0 23 3.35	1.7450	4 39 47.2	13.992
11	0 24 48.08	1.7461	4 53 46.2	13.973
12	0 26 32.88	1.7472	5 7 44.0	13.954
13	0 28 17.74	1.7483	5 21 40.7	13.935
14	0 30 2.68	1.7496	5 35 36.2	13.915
15	0 31 47.69	1.7508	5 49 30.5	13.893
16	0 33 32.78	1.7522	6 3 23.4	13.871
17	0 35 17.95	1.7535	6 17 15.0	13.848
18	0 37 3.20	1.7549	6 31 5.2	13.825
19	0 38 48.54	1.7565	6 44 54.0	13.801
20	0 40 33.98	1.7582	6 58 41.3	13.776
21	0 42 19.52	1.7598	7 12 27.1	13.750
22	0 44 5.15	1.7615	7 26 11.3	13.723
23	0 45 50.90	1.7633	7 39 53.9	13.696
24	0 47 36.75	1.7651	N. 7 53 34.8	13.668

FRIDAY 27.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	0 47 36.75	1.7651	N. 7 53 34.8	13.668
1	0 49 22.71	1.7670	8 7 14.0	13.639
2	0 51 8.79	1.7690	8 20 51.5	13.610
3	0 52 54.99	1.7710	8 34 27.2	13.579
4	0 54 41.31	1.7731	8 48 1.0	13.548
5	0 56 27.76	1.7753	9 1 32.9	13.516
6	0 58 14.34	1.7774	9 15 2.9	13.483
7	1 0 1.05	1.7797	9 28 30.9	13.449
8	1 1 47.90	1.7821	9 41 56.8	13.415
9	1 3 34.90	1.7845	9 55 20.7	13.380
10	1 5 22.04	1.7868	10 8 42.4	13.343
11	1 7 9.32	1.7893	10 22 1.9	13.307
12	1 8 56.76	1.7920	10 35 19.2	13.269
13	1 10 44.36	1.7947	10 48 34.2	13.231
14	1 12 32.12	1.7973	11 1 46.9	13.192
15	1 14 20.04	1.8000	11 14 57.2	13.152
16	1 16 8.12	1.8028	11 28 5.1	13.110
17	1 17 56.38	1.8058	11 41 10.4	13.068
18	1 19 44.81	1.8087	11 54 13.3	13.027
19	1 21 33.42	1.8117	12 7 13.6	12.983
20	1 23 22.21	1.8147	12 20 11.3	12.939
21	1 25 11.18	1.8178	12 33 6.3	12.893
22	1 27 0.35	1.8210	12 45 58.5	12.848
23	1 28 49.70	1.8242	N. 12 58 48.0	12.802

SATURDAY 28.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	1 30 39.25	1.8275	N. 13 11 34.7	12.754
1	1 32 29.00	1.8308	13 24 18.5	12.706
2	1 34 18.95	1.8342	13 36 59.4	12.657
3	1 36 9.10	1.8376	13 49 37.3	12.607
4	1 37 59.46	1.8411	14 2 12.2	12.556
5	1 39 50.03	1.8447	14 14 44.0	12.503
6	1 41 40.82	1.8483	14 27 12.6	12.451
7	1 43 31.83	1.8520	14 39 38.1	12.398
8	1 45 23.06	1.8557	14 52 0.4	12.344
9	1 47 14.51	1.8594	15 4 19.4	12.289
10	1 49 6.19	1.8633	15 16 35.1	12.233
11	1 50 58.10	1.8672	15 28 47.4	12.176
12	1 52 50.25	1.8711	15 40 56.2	12.118
13	1 54 42.63	1.8750	15 53 1.5	12.059
14	1 56 35.25	1.8791	16 5 3.3	12.000
15	1 58 28.12	1.8832	16 17 1.5	11.940
16	2 0 21.23	1.8873	16 28 56.1	11.878
17	2 2 14.59	1.8915	16 40 46.9	11.816
18	2 4 8.21	1.8958	16 52 34.0	11.753
19	2 6 2.08	1.8999	17 4 17.3	11.689
20	2 7 56.20	1.9043	17 15 56.7	11.624
21	2 9 50.59	1.9087	17 27 32.2	11.558
22	2 11 45.24	1.9130	17 39 3.7	11.491
23	2 13 40.15	1.9175	17 50 31.1	11.423
24	2 15 35.34	1.9220	N. 18 1 54.5	11.355

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	2 15 35.34	1.9220	N. 18 1 54.5	11.355
1	2 17 30.79	1.9265	18 13 13.7	11.285
2	2 19 26.52	1.9312	18 24 28.7	11.214
3	2 21 22.53	1.9358	18 35 39.4	11.143
4	2 23 18.81	1.9404	18 46 45.9	11.072
5	2 25 15.38	1.9452	18 57 48.0	10.998
6	2 27 12.23	1.9499	19 8 45.7	10.923
7	2 29 9.37	1.9547	19 19 38.8	10.848
8	2 31 6.79	1.9594	19 30 27.4	10.773
9	2 33 4.50	1.9643	19 41 11.5	10.696
10	2 35 2.51	1.9693	19 51 50.9	10.618
11	2 37 0.81	1.9742	20 2 25.6	10.538
12	2 38 59.41	1.9792	20 12 55.5	10.458
13	2 40 58.31	1.9842	20 23 20.6	10.378
14	2 42 57.51	1.9892	20 33 40.8	10.296
15	2 44 57.01	1.9943	20 43 56.1	10.213
16	2 46 56.82	1.9993	20 54 6.4	10.130
17	2 48 56.93	2.0044	21 4 11.7	10.045
18	2 50 57.35	2.0096	21 14 11.8	9.959
19	2 52 58.08	2.0148	21 24 6.8	9.873
20	2 54 59.13	2.0201	21 33 56.5	9.784
21	2 57 0.49	2.0253	21 43 40.9	9.696
22	2 59 2.16	2.0305	21 53 20.0	9.607
23	3 1 4.15	2.0358	N. 22 2 53.7	9.516

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	3 3 6.45	2.0411	N. 22 12 21.9	9.424
1	3 5 9.08	2.0464	22 21 44.6	9.332
2	3 7 12.02	2.0517	22 31 1.7	9.238
3	3 9 15.28	2.0571	22 40 13.1	9.143
4	3 11 18.87	2.0625	22 49 18.8	9.047
5	3 13 22.78	2.0678	22 58 18.7	8.951
6	3 15 27.01	2.0733	23 7 12.9	8.853
7	3 17 31.57	2.0787	23 16 1.1	8.754
8	3 19 36.45	2.0841	23 24 43.4	8.655
9	3 21 41.66	2.0896	23 33 19.7	8.554
10	3 23 47.20	2.0950	23 41 49.9	8.452
11	3 25 53.06	2.1004	23 50 13.9	8.349
12	3 27 59.25	2.1058	23 58 31.8	8.246
13	3 30 5.76	2.1113	24 6 43.4	8.141
14	3 32 12.61	2.1168	24 14 48.7	8.036
15	3 34 19.78	2.1222	24 22 47.7	7.929
16	3 36 27.27	2.1276	24 30 40.2	7.822
17	3 38 35.09	2.1331	24 38 26.3	7.713
18	3 40 43.24	2.1386	24 46 5.8	7.603
19	3 42 51.72	2.1440	24 53 38.7	7.492
20	3 45 0.52	2.1494	25 1 4.8	7.380
21	3 47 9.65	2.1548	25 8 24.3	7.268
22	3 49 19.10	2.1603	25 15 37.0	7.154
23	3 51 28.88	2.1657	25 22 42.8	7.039
24	3 53 38.98	2.1710	N. 25 29 41.7	6.924

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	3 53 38.98	2.1710	N. 25 29 41.7	6.924
1	3 55 49.40	2.1763	25 36 33.7	6.808
2	3 58 0.14	2.1818	25 43 18.6	6.690
3	4 0 11.21	2.1871	25 49 56.5	6.571
4	4 2 22.59	2.1923	25 56 27.1	6.451
5	4 4 34.29	2.1976	26 2 50.6	6.331
6	4 6 46.30	2.2028	26 9 6.8	6.210
7	4 8 58.63	2.2081	26 15 15.8	6.088
8	4 11 11.27	2.2133	26 21 17.3	5.963
9	4 13 24.22	2.2184	26 27 11.4	5.839
10	4 15 37.48	2.2236	26 32 58.0	5.713
11	4 17 51.05	2.2287	26 38 37.0	5.588
12	4 20 4.92	2.2338	26 44 8.5	5.461
13	4 22 19.10	2.2388	26 49 32.3	5.332
14	4 24 33.57	2.2437	26 54 48.3	5.203
15	4 26 48.34	2.2487	26 59 56.6	5.073
16	4 29 3.41	2.2535	27 4 57.0	4.942
17	4 31 18.76	2.2583	27 9 49.6	4.810
18	4 33 34.41	2.2632	27 14 34.2	4.677
19	4 35 50.34	2.2679	27 19 10.8	4.543
20	4 38 6.56	2.2727	27 23 39.4	4.409
21	4 40 23.06	2.2773	27 27 59.9	4.274
22	4 42 39.83	2.2818	27 32 12.3	4.138
23	4 44 56.88	2.2864	N. 27 36 16.4	4.000

WEDNESDAY, APRIL 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	4 47 14.20	2.2909	N. 27 40 12.3	3.862

PHASES OF THE MOON.

			d	h	m
☽	First Quarter	Mar.	4	17	3.0
○	Full Moon		11	16	18.5
☾	Last Quarter		18	7	39.4
●	New Moon		26	6	9.1

			d	h
☾	Perigee	Mar.	12	10.3
☾	Apogee		27	3.5

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	0 40 9.75	9.100	N. 4 19 32.6	+57.98	16 1.89	64.47	4 8.86	0.755
Thur.	2	0 43 48.18	9.105	4 42 41.6	57.77	16 1.62	64.49	3 50.79	0.751
Frid.	3	0 47 26.71	9.110	5 5 45.4	57.55	16 1.35	64.51	3 32.83	0.746
Sat.	4	0 51 5.36	9.115	5 28 43.7	+57.31	16 1.08	64.53	3 14.98	0.741
SUN.	5	0 54 44.16	9.121	5 51 36.1	57.05	16 0.81	64.55	2 57.27	0.735
Mon.	6	0 58 23.12	9.127	6 14 22.2	56.78	16 0.54	64.58	2 39.71	0.728
Tues.	7	1 2 2.25	9.134	6 37 1.8	+56.50	16 0.27	64.61	2 22.33	0.720
Wed.	8	1 5 41.57	9.143	6 59 34.6	56.22	16 0.00	64.64	2 5.15	0.711
Thur.	9	1 9 21.10	9.152	7 22 0.2	55.92	15 59.73	64.68	1 48.18	0.702
Frid.	10	1 13 0.87	9.163	7 44 18.2	+55.60	15 59.46	64.72	1 31.45	0.692
Sat.	11	1 16 40.91	9.174	8 6 28.5	55.26	15 59.19	64.76	1 14.98	0.681
SUN.	12	1 20 21.24	9.187	8 28 30.8	54.92	15 58.91	64.80	0 58.79	0.668
Mon.	13	1 24 1.87	9.200	8 50 24.6	+54.57	15 58.64	64.84	0 42.91	0.655
Tues.	14	1 27 42.83	9.214	9 12 9.8	54.20	15 58.37	64.89	0 27.35	0.641
Wed.	15	1 31 24.12	9.228	9 33 46.0	53.81	15 58.09	64.94	0 12.13	0.627
Thur.	16	1 35 5.78	9.244	9 55 12.8	+53.41	15 57.82	64.99	0 2.73	0.611
Frid.	17	1 38 47.82	9.260	10 16 29.8	53.00	15 57.54	65.04	0 17.21	0.595
Sat.	18	1 42 30.25	9.277	10 37 36.9	52.58	15 57.27	65.10	0 31.30	0.578
SUN.	19	1 46 13.08	9.294	10 58 33.6	+52.14	15 57.00	65.16	0 44.98	0.561
Mon.	20	1 49 56.33	9.311	11 19 19.5	51.69	15 56.73	65.22	0 58.24	0.544
Tues.	21	1 53 40.01	9.329	11 39 54.4	51.22	15 56.47	65.28	1 11.08	0.526
Wed.	22	1 57 24.14	9.348	12 0 17.9	+50.73	15 56.21	65.34	1 23.48	0.507
Thur.	23	2 1 8.72	9.367	12 20 29.6	50.23	15 55.95	65.40	1 35.42	0.488
Frid.	24	2 4 53.76	9.387	12 40 29.1	49.72	15 55.69	65.47	1 46.90	0.469
Sat.	25	2 8 39.27	9.407	13 0 16.2	+49.19	15 55.44	65.54	1 57.91	0.449
SUN.	26	2 12 25.27	9.427	13 19 50.4	48.65	15 55.19	65.61	2 8.45	0.429
Mon.	27	2 16 11.76	9.447	13 39 11.5	48.09	15 54.94	65.68	2 18.50	0.408
Tues.	28	2 19 58.74	9.468	13 58 19.1	+47.52	15 54.70	65.76	2 28.05	0.388
Wed.	29	2 23 46.21	9.489	14 17 12.9	46.94	15 54.46	65.83	2 37.10	0.367
Thur.	30	2 27 34.19	9.510	14 35 52.4	46.35	15 54.22	65.91	2 45.65	0.346
Frid.	31	2 31 22.68	9.531	N.14 54 17.4	+45.74	15 53.98	65.99	2 53.69	0.324

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0^s.18 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	0 40 9.12	9.102	N. 4 19 28.6	+57.99	4 8.91	0.755	0 36 0.20
Thur.	2	0 43 47.60	9.106	4 42 37.9	57.78	3 50.84	0.751	0 39 56.76
Frid.	3	0 47 26.18	9.110	5 5 42.0	57.56	3 32.87	0.746	0 43 53.31
Sat.	4	0 51 4.88	9.115	5 28 40.6	+57.32	3 15.02	0.741	0 47 49.86
SUN.	5	0 54 43.72	9.121	5 51 33.3	57.07	2 57.31	0.735	0 51 46.42
Mon.	6	0 58 22.72	9.128	6 14 19.7	56.80	2 39.75	0.728	0 55 42.97
Tues.	7	1 2 1.89	9.136	6 36 59.6	+56.52	2 22.36	0.720	0 59 39.53
Wed.	8	1 5 41.25	9.145	6 59 32.6	56.22	2 5.17	0.711	1 3 36.08
Thur.	9	1 9 20.83	9.154	7 21 58.4	55.92	1 48.20	0.702	1 7 32.64
Frid.	10	1 13 0.65	9.165	7 44 16.8	+55.60	1 31.46	0.692	1 11 29.19
Sat.	11	1 16 40.73	9.176	8 6 27.4	55.27	1 14.99	0.681	1 15 25.74
SUN.	12	1 20 21.10	9.188	8 28 29.9	54.93	0 58.80	0.668	1 19 22.30
Mon.	13	1 24 1.77	9.201	8 50 24.0	+54.58	0 42.91	0.655	1 23 18.85
Tues.	14	1 27 42.76	9.215	9 12 9.4	54.21	0 27.35	0.641	1 27 15.41
Wed.	15	1 31 24.09	9.230	9 33 45.8	53.82	0 12.13	0.627	1 31 11.96
Thur.	16	1 35 5.79	9.245	9 55 12.8	+53.42	0 2.73	0.611	1 35 8.52
Frid.	17	1 38 47.86	9.261	10 16 30.1	53.01	0 17.21	0.595	1 39 5.07
Sat.	18	1 42 30.32	9.278	10 37 37.4	52.59	0 31.30	0.578	1 43 1.62
SUN.	19	1 46 13.19	9.295	10 58 34.3	+52.15	0 44.98	0.561	1 46 58.18
Mon.	20	1 49 56.48	9.313	11 19 20.4	51.69	0 58.25	0.544	1 50 54.73
Tues.	21	1 53 40.20	9.331	11 39 55.5	51.22	1 11.09	0.526	1 54 51.29
Wed.	22	1 57 24.36	9.349	12 0 19.1	+50.74	1 23.49	0.507	1 58 47.84
Thur.	23	2 1 8.97	9.368	12 20 30.9	50.24	1 35.43	0.488	2 2 44.40
Frid.	24	2 4 54.04	9.388	12 40 30.6	49.73	1 46.91	0.469	2 6 40.95
Sat.	25	2 8 39.58	9.408	13 0 17.8	+49.20	1 57.92	0.449	2 10 37.51
SUN.	26	2 12 25.61	9.428	13 19 52.2	48.66	2 8.46	0.429	2 14 34.06
Mon.	27	2 16 12.12	9.448	13 39 13.4	48.10	2 18.51	0.408	2 18 30.62
Tues.	28	2 19 59.12	9.469	13 58 21.1	+47.53	2 28.07	0.388	2 22 27.18
Wed.	29	2 23 46.62	9.490	14 17 15.0	46.95	2 37.12	0.367	2 26 23.73
Thur.	30	2 27 34.62	9.511	14 35 54.6	46.35	2 45.67	0.346	2 30 20.29
Frid.	31	2 31 23.14	9.532	N. 14 54 19.7	+45.74	2 53.71	0.324	2 34 16.84

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, +9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		True Longitude.		Diff. for 1 Hour.	Latitude.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	91	10 55 36.6	55 19.8	147.97	+0.78	9.999 8205	+51.1	23 20 9.79
2	92	11 54 46.8	54 29.8	147.88	0.77	9.999 9431	51.0	23 16 13.88
3	93	12 53 54.7	53 37.6	147.78	0.71	0.000 0654	51.0	23 12 17.97
4	94	13 53 0.2	52 43.0	147.68	+0.63	0.000 1877	+50.9	23 8 22.06
5	95	14 52 3.5	51 46.2	147.59	0.54	0.000 3098	50.9	23 4 26.16
6	96	15 51 4.4	50 46.9	147.49	0.42	0.000 4320	51.0	23 0 30.25
7	97	16 50 3.0	49 45.4	147.39	+0.28	0.000 5545	+51.0	22 56 34.34
8	98	17 48 59.3	48 41.7	147.30	0.14	0.000 6771	51.1	22 52 38.43
9	99	18 47 53.5	47 35.7	147.21	+0.01	0.000 8001	51.3	22 48 42.52
10	100	19 46 45.5	46 27.6	147.12	−0.12	0.000 9234	+51.5	22 44 46.61
11	101	20 45 35.6	45 17.6	147.04	0.22	0.001 0471	51.6	22 40 50.70
12	102	21 44 23.7	44 5.6	146.96	0.29	0.001 1711	51.7	22 36 54.80
13	103	22 43 10.0	42 51.7	146.89	−0.35	0.001 2953	+51.7	22 32 58.89
14	104	23 41 54.5	41 36.1	146.82	0.36	0.001 4195	51.7	22 29 2.98
15	105	24 40 37.3	40 18.8	146.75	0.35	0.001 5436	51.6	22 25 7.07
16	106	25 39 18.4	38 59.8	146.68	−0.31	0.001 6674	+51.5	22 21 11.16
17	107	26 37 57.9	37 39.1	146.61	0.23	0.001 7907	51.3	22 17 15.25
18	108	27 36 35.7	36 16.8	146.54	0.14	0.001 9135	51.0	22 13 19.34
19	109	28 35 11.8	34 52.8	146.47	−0.03	0.002 0354	+50.6	22 9 23.44
20	110	29 33 46.2	33 27.1	146.40	+0.09	0.002 1565	50.2	22 5 27.53
21	111	30 32 19.0	31 59.7	146.33	0.22	0.002 2765	49.8	22 1 31.62
22	112	31 30 50.0	30 30.6	146.25	+0.34	0.002 3955	+49.3	21 57 35.71
23	113	32 29 19.2	28 59.7	146.18	0.45	0.002 5132	48.8	21 53 39.80
24	114	33 27 46.7	27 27.0	146.10	0.56	0.002 6296	48.3	21 49 43.89
25	115	34 26 12.4	25 52.6	146.03	+0.65	0.002 7447	+47.7	21 45 47.98
26	116	35 24 36.2	24 16.3	145.95	0.72	0.002 8584	47.1	21 41 52.07
27	117	36 22 58.2	22 38.1	145.87	0.76	0.002 9706	46.5	21 37 56.16
28	118	37 21 18.2	20 58.0	145.79	+0.77	0.003 0815	+45.9	21 34 0.25
29	119	38 19 36.3	19 16.0	145.71	0.77	0.003 1909	45.3	21 30 4.34
30	120	39 17 52.4	17 32.0	145.63	0.73	0.003 2989	44.7	21 26 8.43
31	121	40 16 6.5	15 45.9	145.55	+0.66	0.003 4056	+44.2	21 22 12.52

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
$-9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 3.5	15 8.3	55 10.22	+1.377	55 27.76	+1.545	4 20.5	2.22	5.7
2	15 13.7	15 19.5	55 47.30	1.710	56 8.78	1.868	5 15.0	2.31	6.7
3	15 25.9	15 32.7	56 32.09	2.015	56 57.07	2.145	6 10.9	2.33	7.7
4	15 39.9	15 47.4	57 23.47	+2.250	57 50.96	+2.325	7 6.6	2.29	8.7
5	15 55.0	16 2.8	58 19.14	2.364	58 47.53	2.360	8 0.9	2.23	9.7
6	16 10.4	16 17.8	59 15.58	2.304	59 42.59	2.190	8 53.5	2.16	10.7
7	16 24.7	16 30.9	60 7.90	+2.018	60 30.78	+1.785	9 44.8	2.12	11.7
8	16 36.3	16 40.6	60 50.51	1.494	61 6.44	1.152	10 35.6	2.12	12.7
9	16 43.8	16 45.6	61 17.99	+0.767	61 24.73	+0.353	11 27.1	2.18	13.7
10	16 46.1	16 45.1	61 26.40	−0.076	61 22.91	−0.504	12 20.6	2.29	14.7
11	16 42.8	16 39.2	61 14.38	0.913	61 1.13	1.289	13 17.1	2.42	15.7
12	16 34.4	16 28.6	60 43.62	1.620	60 22.46	1.897	14 16.8	2.54	16.7
13	16 22.1	16 14.9	59 58.32	−2.116	59 31.92	−2.273	15 18.7	2.59	17.7
14	16 7.3	15 59.4	59 4.00	2.370	58 35.26	2.411	16 20.6	2.54	18.7
15	15 51.5	15 43.8	58 6.33	2.402	57 37.78	2.350	17 20.1	2.40	19.7
16	15 36.2	15 29.0	57 10.08	−2.260	56 43.65	−2.140	18 15.3	2.20	20.7
17	15 22.2	15 16.0	56 18.80	1.998	55 55.77	1.839	19 5.7	2.00	21.7
18	15 10.2	15 5.1	55 34.72	1.669	55 15.75	1.492	19 51.6	1.83	22.7
19	15 0.5	14 56.5	54 58.92	−1.313	54 44.24	−1.134	20 34.0	1.71	23.7
20	14 53.0	14 50.2	54 31.69	0.959	54 21.21	0.790	21 14.1	1.64	24.7
21	14 47.9	14 46.1	54 12.71	0.628	54 6.11	0.473	21 53.0	1.61	25.7
22	14 44.8	14 43.9	54 1.32	−0.327	53 58.23	−0.190	22 31.9	1.63	26.7
23	14 43.5	14 43.5	53 56.74	−0.060	53 56.76	+0.062	23 11.7	1.69	27.7
24	14 43.9	14 44.7	53 58.20	+0.178	54 1.00	0.288	23 53.4	1.79	28.7
25	14 45.8	14 47.3	54 5.10	+0.394	54 10.45	+0.497	6	. .	0.0
26	14 49.1	14 51.2	54 17.02	0.599	54 24.82	0.702	0 37.9	1.92	1.0
27	14 53.6	14 56.4	54 33.86	0.806	54 44.16	0.912	1 25.6	2.06	2.0
28	14 59.6	15 3.1	54 55.75	+1.020	55 8.66	+1.132	2 16.6	2.18	3.0
29	15 7.0	15 11.3	55 22.93	1.246	55 38.58	1.363	3 10.2	2.27	4.0
30	15 15.9	15 21.0	55 55.64	1.480	56 14.09	1.595	4 5.2	2.30	5.0
31	15 26.4	15 32.1	56 33.89	+1.704	56 54.96	+1.806	5 0.0	2.26	6.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 1.					FRIDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 47 14.20	2.2909	N. 27 40 12.3	3.862	0	6 40 53.85	2.4106	N. 27 53 36.1	3.491
1	4 49 31.79	2.2953	27 43 59.9	3.723	1	6 43 18.49	2.4108	27 50 1.8	3.653
2	4 51 49.64	2.2997	27 47 39.1	3.583	2	6 45 43.14	2.4108	27 46 17.8	3.814
3	4 54 7.75	2.3039	27 51 9.9	3.443	3	6 48 7.79	2.4109	27 42 24.1	3.975
4	4 56 26.11	2.3082	27 54 32.2	3.301	4	6 50 32.45	2.4108	27 38 20.8	4.136
5	4 58 44.73	2.3123	27 57 46.0	3.159	5	6 52 57.09	2.4106	27 34 7.8	4.298
6	5 1 3.59	2.3163	28 0 51.3	3.017	6	6 55 21.72	2.4103	27 29 45.1	4.459
7	5 3 22.69	2.3204	28 3 48.0	2.873	7	6 57 46.33	2.4100	27 25 12.7	4.620
8	5 5 42.04	2.3244	28 6 36.1	2.729	8	7 0 10.92	2.4096	27 20 30.7	4.781
9	5 8 1.62	2.3283	28 9 15.5	2.583	9	7 2 35.48	2.4091	27 15 39.0	4.942
10	5 10 21.43	2.3321	28 11 46.1	2.438	10	7 5 0.01	2.4085	27 10 37.7	5.103
11	5 12 41.47	2.3358	28 14 8.0	2.291	11	7 7 24.50	2.4078	27 5 26.7	5.263
12	5 15 1.72	2.3394	28 16 21.0	2.143	12	7 9 48.94	2.4069	27 0 6.1	5.423
13	5 17 22.20	2.3430	28 18 25.2	1.996	13	7 12 13.33	2.4061	26 54 35.9	5.583
14	5 19 42.88	2.3464	28 20 20.5	1.847	14	7 14 37.67	2.4051	26 48 56.1	5.743
15	5 22 3.77	2.3499	28 22 6.8	1.698	15	7 17 1.94	2.4040	26 43 6.7	5.903
16	5 24 24.87	2.3532	28 23 44.2	1.548	16	7 19 26.15	2.4030	26 37 7.7	6.063
17	5 26 46.16	2.3564	28 25 12.5	1.396	17	7 21 50.30	2.4018	26 30 59.2	6.222
18	5 29 7.64	2.3596	28 26 31.8	1.246	18	7 24 14.37	2.4005	26 24 41.1	6.380
19	5 31 29.31	2.3627	28 27 42.1	1.094	19	7 26 38.36	2.3991	26 18 13.6	6.538
20	5 33 51.16	2.3657	28 28 43.1	0.941	20	7 29 2.26	2.3977	26 11 36.6	6.696
21	5 36 13.19	2.3686	28 29 35.0	0.788	21	7 31 26.08	2.3963	26 4 50.1	6.854
22	5 38 35.39	2.3713	28 30 17.7	0.635	22	7 33 49.81	2.3947	25 57 54.1	7.012
23	5 40 57.75	2.3740	N. 28 30 51.2	0.482	23	7 36 13.44	2.3930	N. 25 50 48.7	7.168
	THURSDAY 2.					SATURDAY 4.			
0	5 43 20.27	2.3767	N. 28 31 15.5	0.327	0	7 38 36.97	2.3913	N. 25 43 34.0	7.323
1	5 45 42.95	2.3792	28 31 30.4	0.171	1	7 41 0.40	2.3896	25 36 9.9	7.480
2	5 48 5.77	2.3816	28 31 36.0	+0.016	2	7 43 23.72	2.3878	25 28 36.4	7.636
3	5 50 28.74	2.3839	28 31 32.3	−0.140	3	7 45 46.93	2.3858	25 20 53.6	7.791
4	5 52 51.84	2.3862	28 31 19.2	0.297	4	7 48 10.02	2.3839	25 13 1.5	7.945
5	5 55 15.08	2.3883	28 30 56.7	0.453	5	7 50 33.00	2.3819	25 5 0.2	8.098
6	5 57 38.44	2.3904	28 30 24.8	0.611	6	7 52 55.85	2.3798	24 56 49.7	8.252
7	6 0 1.93	2.3924	28 29 43.4	0.769	7	7 55 18.58	2.3778	24 48 30.0	8.404
8	6 2 25.53	2.3942	28 28 52.5	0.927	8	7 57 41.18	2.3756	24 40 1.2	8.556
9	6 4 49.23	2.3959	28 27 52.2	1.085	9	8 0 3.65	2.3734	24 31 23.3	8.707
10	6 7 13.04	2.3977	28 26 42.3	1.244	10	8 2 25.98	2.3711	24 22 36.4	8.858
11	6 9 36.95	2.3992	28 25 22.9	1.403	11	8 4 48.18	2.3688	24 13 40.4	9.008
12	6 12 0.94	2.4006	28 23 54.0	1.562	12	8 7 10.24	2.3665	24 4 35.4	9.158
13	6 14 25.02	2.4020	28 22 15.5	1.722	13	8 9 32.16	2.3641	23 55 21.5	9.306
14	6 16 49.18	2.4033	28 20 27.4	1.883	14	8 11 53.93	2.3616	23 45 58.7	9.454
15	6 19 13.42	2.4045	28 18 29.6	2.043	15	8 14 15.55	2.3592	23 36 27.0	9.602
16	6 21 37.72	2.4055	28 16 22.3	2.203	16	8 16 37.03	2.3567	23 26 46.5	9.748
17	6 24 2.08	2.4065	28 14 5.3	2.363	17	8 18 58.35	2.3541	23 16 57.2	9.894
18	6 26 26.50	2.4074	28 11 38.7	2.524	18	8 21 19.52	2.3516	23 6 59.2	10.039
19	6 28 50.97	2.4082	28 9 2.4	2.685	19	8 23 40.54	2.3490	22 56 52.5	10.183
20	6 31 15.48	2.4088	28 6 16.5	2.846	20	8 26 1.40	2.3463	22 46 37.2	10.326
21	6 33 40.03	2.4094	28 3 20.9	3.008	21	8 28 22.10	2.3437	22 36 13.4	10.468
22	6 36 4.61	2.4099	28 0 15.6	3.168	22	8 30 42.64	2.3410	22 25 41.0	10.611
23	6 38 29.22	2.4103	27 57 0.7	3.329	23	8 33 3.02	2.3383	22 15 0.1	10.752
24	6 40 53.85	2.4106	N. 27 53 36.1	3.491	24	8 35 23.24	2.3356	N. 22 4 10.8	10.891

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 5.					TUESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 35 23.24	2.3356	N. 22 4 10.8	10.891	0	10 24 28.67	2.2204	N. 11 0 32.0	16.280
1	8 37 43.29	2.3328	21 53 13.2	11.030	1	10 26 41.85	2.2190	10 44 12.8	16.359
2	8 40 3.18	2.3302	21 42 7.2	11.169	2	10 28 54.95	2.2177	10 27 48.9	16.437
3	8 42 22.91	2.3274	21 30 52.9	11.306	3	10 31 7.97	2.2164	10 11 20.4	16.513
4	8 44 42.47	2.3246	21 19 30.5	11.442	4	10 33 20.92	2.2152	9 54 47.4	16.587
5	8 47 1.86	2.3218	21 7 59.9	11.578	5	10 35 33.79	2.2140	9 38 10.0	16.659
6	8 49 21.08	2.3190	20 56 21.2	11.712	6	10 37 46.60	2.2130	9 21 28.3	16.730
7	8 51 40.14	2.3163	20 44 34.5	11.845	7	10 39 59.35	2.2119	9 4 42.4	16.799
8	8 53 59.04	2.3135	20 32 39.8	11.978	8	10 42 12.03	2.2109	8 47 52.4	16.867
9	8 56 17.76	2.3107	20 20 37.2	12.109	9	10 44 24.66	2.2101	8 30 58.4	16.933
10	8 58 36.32	2.3079	20 8 26.7	12.240	10	10 46 37.24	2.2093	8 14 0.4	16.997
11	9 0 54.71	2.3051	19 56 8.4	12.368	11	10 48 49.77	2.2085	7 56 58.7	17.059
12	9 3 12.93	2.3023	19 43 42.5	12.497	12	10 51 2.26	2.2078	7 39 53.3	17.120
13	9 5 30.98	2.2995	19 31 8.8	12.624	13	10 53 14.71	2.2073	7 22 44.3	17.179
14	9 7 48.87	2.2968	19 18 27.6	12.749	14	10 55 27.13	2.2068	7 5 31.8	17.237
15	9 10 6.59	2.2940	19 5 38.9	12.874	15	10 57 39.52	2.2063	6 48 15.9	17.292
16	9 12 24.15	2.2913	18 52 42.7	12.998	16	10 59 51.88	2.2058	6 30 56.8	17.346
17	9 14 41.55	2.2886	18 39 39.1	13.121	17	11 2 4.22	2.2056	6 13 34.4	17.398
18	9 16 58.78	2.2858	18 26 28.2	13.243	18	11 4 16.55	2.2054	5 56 9.0	17.448
19	9 19 15.85	2.2832	18 13 10.0	13.363	19	11 6 28.87	2.2053	5 38 40.6	17.498
20	9 21 32.76	2.2804	17 59 44.6	13.483	20	11 8 41.18	2.2051	5 21 9.3	17.544
21	9 23 49.50	2.2778	17 46 12.1	13.600	21	11 10 53.48	2.2051	5 3 35.3	17.589
22	9 26 6.09	2.2752	17 32 32.6	13.717	22	11 13 5.79	2.2053	4 45 58.6	17.633
23	9 28 22.52	2.2726	N. 17 18 46.1	13.832	23	11 15 18.11	2.2054	N. 4 28 19.4	17.673
	MONDAY 6.					WEDNESDAY 8.			
0	9 30 38.80	2.2700	N. 17 4 52.8	13.946	0	11 17 30.44	2.2057	N. 4 10 37.8	17.713
1	9 32 54.92	2.2675	16 50 52.6	14.059	1	11 19 42.79	2.2060	3 52 53.9	17.750
2	9 35 10.90	2.2650	16 36 45.7	14.170	2	11 21 55.16	2.2064	3 35 7.8	17.786
3	9 37 26.72	2.2625	16 22 32.2	14.281	3	11 24 7.56	2.2069	3 17 19.6	17.820
4	9 39 42.40	2.2601	16 8 12.0	14.390	4	11 26 19.99	2.2074	2 59 29.4	17.852
5	9 41 57.93	2.2576	15 53 45.4	14.498	5	11 28 32.45	2.2081	2 41 37.4	17.882
6	9 44 13.31	2.2552	15 39 12.3	14.604	6	11 30 44.96	2.2088	2 23 43.6	17.910
7	9 46 28.55	2.2529	15 24 32.9	14.709	7	11 32 57.51	2.2096	2 5 48.2	17.936
8	9 48 43.66	2.2507	15 9 47.2	14.813	8	11 35 10.11	2.2105	1 47 51.3	17.960
9	9 50 58.63	2.2483	14 54 55.3	14.916	9	11 37 22.77	2.2115	1 29 53.0	17.983
10	9 53 13.46	2.2461	14 39 57.3	15.017	10	11 39 35.49	2.2126	1 11 53.4	18.003
11	9 55 28.16	2.2440	14 24 53.3	15.117	11	11 41 48.28	2.2138	0 53 52.6	18.021
12	9 57 42.74	2.2418	14 9 43.3	15.215	12	11 44 1.14	2.2149	0 35 50.9	18.037
13	9 59 57.18	2.2398	13 54 27.5	15.312	13	11 46 14.07	2.2162	N. 0 17 48.2	18.052
14	10 2 11.51	2.2378	13 39 5.9	15.408	14	11 48 27.08	2.2176	S. 0 0 15.3	18.064
15	10 4 25.71	2.2358	13 23 38.6	15.501	15	11 50 40.18	2.2191	0 18 19.5	18.074
16	10 6 39.80	2.2338	13 8 5.8	15.593	16	11 52 53.37	2.2207	0 36 24.2	18.082
17	10 8 53.77	2.2319	12 52 27.4	15.685	17	11 55 6.66	2.2223	0 54 29.3	18.088
18	10 11 7.63	2.2302	12 36 43.6	15.774	18	11 57 20.05	2.2240	1 12 34.8	18.093
19	10 13 21.39	2.2284	12 20 54.5	15.863	19	11 59 33.54	2.2258	1 30 40.5	18.095
20	10 15 35.04	2.2267	12 5 0.1	15.949	20	12 1 47.14	2.2277	1 48 46.2	18.095
21	10 17 48.59	2.2250	11 49 0.6	16.034	21	12 4 0.86	2.2297	2 6 51.9	18.093
22	10 20 2.04	2.2234	11 32 56.0	16.118	22	12 6 14.70	2.2318	2 24 57.4	18.089
23	10 22 15.40	2.2219	11 16 46.4	16.200	23	12 8 28.67	2.2338	2 43 2.6	18.083
24	10 24 28.67	2.2204	N. 11 0 32.0	16.280	24	12 10 42.76	2.2360	S. 3 1 7.4	18.076

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 9.					**SATURDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 10 42.76	2.2360	S. 3 1 7.4	18.076	0	14 2 0.47	2.4248	S. 16 38 5.0	15.122
1	12 12 56.99	2.2383	3 19 11.7	18.065	1	14 4 26.11	2.4298	16 53 8.9	15.008
2	12 15 11.36	2.2408	3 37 15.2	18.052	2	14 6 52.05	2.4349	17 8 5.9	14.891
3	12 17 25.88	2.2432	3 55 17.9	18.038	3	14 9 18.30	2.4401	17 22 55.8	14.771
4	12 19 40.54	2.2457	4 13 19.7	18.022	4	14 11 44.86	2.4452	17 37 38.4	14.650
5	12 21 55.36	2.2484	4 31 20.5	18.003	5	14 14 11.72	2.4503	17 52 13.8	14.528
6	12 24 10.35	2.2511	4 49 20.0	17.981	6	14 16 38.90	2.4556	18 6 41.7	14.402
7	12 26 25.49	2.2538	5 7 18.2	17.958	7	14 19 6.39	2.4608	18 21 2.0	14.275
8	12 28 40.81	2.2568	5 25 15.0	17.933	8	14 21 34.19	2.4658	18 35 14.7	14.147
9	12 30 56.30	2.2597	5 43 10.2	17.906	9	14 24 2.29	2.4710	18 49 19.6	14.015
10	12 33 11.97	2.2627	6 1 3.7	17.876	10	14 26 30.71	2.4763	19 3 16.5	13.882
11	12 35 27.82	2.2658	6 18 55.3	17.843	11	14 28 59.44	2.4813	19 17 5.4	13.747
12	12 37 43.86	2.2689	6 36 44.9	17.809	12	14 31 28.47	2.4864	19 30 46.1	13.610
13	12 40 0.09	2.2722	6 54 32.4	17.773	13	14 33 57.81	2.4916	19 44 18.6	13.472
14	12 42 16.52	2.2755	7 12 17.7	17.736	14	14 36 27.46	2.4967	19 57 42.7	13.331
15	12 44 33.15	2.2789	7 30 0.7	17.696	15	14 38 57.41	2.5017	20 10 58.3	13.188
16	12 46 49.99	2.2824	7 47 41.2	17.653	16	14 41 27.66	2.5068	20 24 5.2	13.043
17	12 49 7.04	2.2859	8 5 19.0	17.607	17	14 43 58.22	2.5118	20 37 3.5	12.898
18	12 51 24.30	2.2895	8 22 54.0	17.560	18	14 46 29.08	2.5168	20 49 52.9	12.749
19	12 53 41.78	2.2933	8 40 26.2	17.511	19	14 49 0.23	2.5217	21 2 33.4	12.600
20	12 55 59.49	2.2970	8 57 55.3	17.459	20	14 51 31.68	2.5266	21 15 4.9	12.448
21	12 58 17.42	2.3008	9 15 21.3	17.406	21	14 54 3.42	2.5315	21 27 27.2	12.295
22	13 0 35.58	2.3047	9 32 44.0	17.349	22	14 56 35.46	2.5363	21 39 40.3	12.141
23	13 2 53.98	2.3087	S. 9 50 3.2	17.291	23	14 59 7.78	2.5411	S. 21 51 44.1	11.984
	FRIDAY 10.					**SUNDAY 12.**			
0	13 5 12.62	2.3127	S. 10 7 18.9	17.232	0	15 1 40.39	2.5458	S. 22 3 38.4	11.825
1	13 7 31.50	2.3168	10 24 31.0	17.169	1	15 4 13.27	2.5504	22 15 23.1	11.665
2	13 9 50.63	2.3209	10 41 39.2	17.104	2	15 6 46.44	2.5551	22 26 58.2	11.504
3	13 12 10.01	2.3251	10 58 43.5	17.037	3	15 9 19.88	2.5596	22 38 23.6	11.342
4	13 14 29.64	2.3294	11 15 43.6	16.968	4	15 11 53.59	2.5641	22 49 39.2	11.177
5	13 16 49.54	2.3338	11 32 39.6	16.897	5	15 14 27.57	2.5685	23 0 44.8	11.010
6	13 19 9.69	2.3381	11 49 31.2	16.823	6	15 17 1.81	2.5728	23 11 40.4	10.843
7	13 21 30.11	2.3425	12 6 18.3	16.747	7	15 19 36.31	2.5771	23 22 25.9	10.673
8	13 23 50.79	2.3470	12 23 0.8	16.668	8	15 22 11.06	2.5813	23 33 1.2	10.503
9	13 26 11.75	2.3516	12 39 38.5	16.588	9	15 24 46.06	2.5853	23 43 26.3	10.332
10	13 28 32.98	2.3562	12 56 11.4	16.506	10	15 27 21.30	2.5893	23 53 41.0	10.158
11	13 30 54.49	2.3608	13 12 39.2	16.421	11	15 29 56.78	2.5933	24 3 45.3	9.984
12	13 33 16.28	2.3655	13 29 1.9	16.334	12	15 32 32.49	2.5971	24 13 39.1	9.808
13	13 35 38.35	2.3703	13 45 19.3	16.245	13	15 35 8.43	2.6008	24 23 22.3	9.631
14	13 38 0.71	2.3750	14 1 31.3	16.154	14	15 37 44.59	2.6045	24 32 54.8	9.453
15	13 40 23.35	2.3798	14 17 37.8	16.061	15	15 40 20.97	2.6080	24 42 16.6	9.273
16	13 42 46.29	2.3848	14 33 38.6	15.965	16	15 42 57.55	2.6114	24 51 27.6	9.093
17	13 45 9.52	2.3896	14 49 33.6	15.867	17	15 45 34.34	2.6148	25 0 27.8	8.912
18	13 47 33.04	2.3945	15 5 22.6	15.767	18	15 48 11.32	2.6179	25 9 17.0	8.728
19	13 49 56.86	2.3995	15 21 5.6	15.665	19	15 50 48.49	2.6211	25 17 55.2	8.545
20	13 52 20.98	2.4045	15 36 42.4	15.560	20	15 53 25.85	2.6241	25 26 22.4	8.361
21	13 54 45.40	2.4095	15 52 12.8	15.453	21	15 56 3.38	2.6268	25 34 38.5	8.175
22	13 57 10.12	2.4145	16 7 36.8	15.346	22	15 58 41.07	2.6295	25 42 43.4	7.988
23	13 59 35.14	2.4196	16 22 54.3	15.235	23	16 1 18.92	2.6322	25 50 37.1	7.802
24	14 2 0.47	2.4248	S. 16 38 5.0	15.122	24	16 3 56.93	2.6347	S. 25 58 19.6	7.613

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 13.					WEDNESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 3 56.93	2.6347	S. 25 58 19.6	7.613	0	18 10 22.97	2.5728	S. 28 21 22.6	1.570
1	16 6 35.08	2.6370	26 5 50.7	7.424	1	18 12 57.19	2.5678	28 19 43.0	1.749
2	16 9 13.37	2.6392	26 13 10.5	7.234	2	18 15 31.10	2.5626	28 17 52.7	1.927
3	16 11 51.78	2.6412	26 20 18.8	7.043	3	18 18 4.70	2.5573	28 15 51.8	2.103
4	16 14 30.31	2.6432	26 27 15.7	6.853	4	18 20 37.98	2.5520	28 13 40.3	2.278
5	16 17 8.96	2.6450	26 34 1.1	6.662	5	18 23 10.94	2.5465	28 11 18.4	2.452
6	16 19 47.71	2.6466	26 40 35.1	6.469	6	18 25 43.56	2.5408	28 8 46.1	2.624
7	16 22 26.55	2.6480	26 46 57.4	6.276	7	18 28 15.84	2.5351	28 6 3.5	2.796
8	16 25 5.47	2.6493	26 53 8.2	6.083	8	18 30 47.77	2.5293	28 3 10.6	2.967
9	16 27 44.47	2.6506	26 59 7.4	5.889	9	18 33 19.35	2.5233	28 0 7.5	3.135
10	16 30 23.54	2.6517	27 4 54.9	5.695	10	18 35 50.57	2.5173	27 56 54.4	3.303
11	16 33 2.67	2.6525	27 10 30.8	5.501	11	18 38 21.42	2.5111	27 53 31.2	3.470
12	16 35 41.84	2.6532	27 15 55.0	5.306	12	18 40 51.90	2.5048	27 49 58.0	3.635
13	16 38 21.05	2.6538	27 21 7.5	5.111	13	18 43 22.00	2.4985	27 46 15.0	3.798
14	16 41 0.30	2.6543	27 26 8.3	4.916	14	18 45 51.72	2.4921	27 42 22.2	3.961
15	16 43 39.56	2.6545	27 30 57.4	4.720	15	18 48 21.05	2.4855	27 38 19.7	4.123
16	16 46 18.84	2.6547	27 35 34.7	4.524	16	18 50 49.98	2.4789	27 34 7.5	4.283
17	16 48 58.12	2.6545	27 40 0.3	4.328	17	18 53 18.52	2.4723	27 29 45.8	4.441
18	16 51 37.38	2.6543	27 44 14.1	4.133	18	18 55 46.65	2.4654	27 25 14.6	4.598
19	16 54 16.63	2.6539	27 48 16.2	3.937	19	18 58 14.37	2.4586	27 20 34.1	4.753
20	16 56 55.85	2.6533	27 52 6.5	3.741	20	19 0 41.68	2.4517	27 15 44.3	4.908
21	16 59 35.03	2.6527	27 55 45.1	3.546	21	19 3 8.57	2.4447	27 10 45.2	5.061
22	17 2 14.17	2.6518	27 59 12.0	3.350	22	19 5 35.04	2.4376	27 5 37.0	5.212
23	17 4 53.25	2.6507	S. 28 2 27.1	3.154	23	19 8 1.08	2.4305	S. 27 0 19.8	5.362
	TUESDAY 14.					THURSDAY 16.			
0	17 7 32.26	2.6495	S. 28 5 30.5	2.958	0	19 10 26.70	2.4233	S. 26 54 53.6	5.511
1	17 10 11.19	2.6481	28 8 22.1	2.763	1	19 12 51.88	2.4161	26 49 18.5	5.658
2	17 12 50.03	2.6466	28 11 2.1	2.569	2	19 15 16.63	2.4088	26 43 34.7	5.803
3	17 15 28.78	2.6449	28 13 30.4	2.374	3	19 17 40.94	2.4015	26 37 42.2	5.947
4	17 18 7.42	2.6430	28 15 47.0	2.180	4	19 20 4.81	2.3941	26 31 41.1	6.089
5	17 20 45.94	2.6409	28 17 52.0	1.987	5	19 22 28.23	2.3867	26 25 31.5	6.231
6	17 23 24.33	2.6388	28 19 45.4	1.793	6	19 24 51.21	2.3793	26 19 13.4	6.371
7	17 26 2.59	2.6364	28 21 27.2	1.601	7	19 27 13.74	2.3718	26 12 47.0	6.508
8	17 28 40.70	2.6338	28 22 57.5	1.408	8	19 29 35.82	2.3643	26 6 12.4	6.646
9	17 31 18.65	2.6312	28 24 16.2	1.216	9	19 31 57.45	2.3567	25 59 29.5	6.782
10	17 33 56.44	2.6284	28 25 23.4	1.025	10	19 34 18.62	2.3490	25 52 38.6	6.914
11	17 36 34.06	2.6254	28 26 19.2	0.835	11	19 36 39.33	2.3414	25 45 39.8	7.047
12	17 39 11.49	2.6223	28 27 3.6	0.645	12	19 38 59.59	2.3338	25 38 33.0	7.178
13	17 41 48.73	2.6189	28 27 36.6	0.456	13	19 41 19.39	2.3262	25 31 18.5	7.307
14	17 44 25.76	2.6154	28 27 58.3	0.268	14	19 43 38.73	2.3185	25 23 56.2	7.435
15	17 47 2.58	2.6118	28 28 8.7	−0.079	15	19 45 57.61	2.3108	25 16 26.3	7.561
16	17 49 39.18	2.6081	28 28 7.8	+0.108	16	19 48 16.03	2.3032	25 8 48.9	7.685
17	17 52 15.55	2.6042	28 27 55.8	0.293	17	19 50 33.99	2.2955	25 1 4.1	7.808
18	17 54 51.68	2.6001	28 27 32.6	0.479	18	19 52 51.49	2.2878	24 53 11.9	7.931
19	17 57 27.56	2.5959	28 26 58.3	0.663	19	19 55 8.53	2.2801	24 45 12.4	8.051
20	18 0 3.19	2.5916	28 26 13.0	0.847	20	19 57 25.10	2.2723	24 37 5.8	8.169
21	18 2 38.55	2.5871	28 25 16.7	1.029	21	19 59 41.21	2.2647	24 28 52.1	8.287
22	18 5 13.64	2.5825	28 24 9.5	1.211	22	20 1 56.86	2.2570	24 20 31.4	8.403
23	18 7 48.45	2.5778	28 22 51.4	1.391	23	20 4 12.05	2.2493	24 12 3.8	8.518
24	18 10 22.97	2.5728	S. 28 21 22.6	1.570	24	20 6 26.78	2.2417	S. 24 3 29.3	8.631

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 17.			
	h m s	s	° ′ ″	″
0	20 6 26.78	2.2417	S. 24 3 29.3	8.631
1	20 8 41.05	2.2340	23 54 48.1	8.742
2	20 10 54.86	2.2263	23 46 0.3	8.852
3	20 13 8.21	2.2187	23 37 5.9	8.961
4	20 15 21.10	2.2111	23 28 5.0	9.068
5	20 17 33.54	2.2036	23 18 57.8	9.173
6	20 19 45.53	2.1960	23 9 44.2	9.278
7	20 21 57.06	2.1884	23 0 24.4	9.381
8	20 24 8.14	2.1810	22 50 58.5	9.483
9	20 26 18.78	2.1735	22 41 26.5	9.583
10	20 28 28.96	2.1660	22 31 48.5	9.683
11	20 30 38.70	2.1586	22 22 4.6	9.779
12	20 32 47.99	2.1512	22 12 15.0	9.874
13	20 34 56.84	2.1439	22 2 19.7	9.969
14	20 37 5.26	2.1367	21 52 18.7	10.063
15	20 39 13.24	2.1293	21 42 12.1	10.155
16	20 41 20.78	2.1222	21 32 0.1	10.245
17	20 43 27.90	2.1150	21 21 42.7	10.334
18	20 45 34.58	2.1078	21 11 20.0	10.423
19	20 47 40.84	2.1008	21 0 52.0	10.509
20	20 49 46.68	2.0938	20 50 18.9	10.595
21	20 51 52.10	2.0868	20 39 40.6	10.679
22	20 53 57.10	2.0798	20 28 57.4	10.762
23	20 56 1.68	2.0729	S. 20 18 9.2	10.843
	SATURDAY 18			
0	20 58 5.85	2.0661	S. 20 7 16.2	10.923
1	21 0 9.61	2.0593	19 56 18.4	11.003
2	21 2 12.97	2.0527	19 45 15.9	11.080
3	21 4 15.93	2.0460	19 34 8.8	11.157
4	21 6 18.49	2.0394	19 22 57.1	11.233
5	21 8 20.66	2.0329	19 11 40.9	11.307
6	21 10 22.44	2.0264	19 0 20.3	11.379
7	21 12 23.83	2.0199	18 48 55.4	11.451
8	21 14 24.83	2.0136	18 37 26.2	11.522
9	21 16 25.46	2.0073	18 25 52.8	11.592
10	21 18 25.71	2.0010	18 14 15.2	11.660
11	21 20 25.58	1.9948	18 2 33.6	11.727
12	21 22 25.09	1.9888	17 50 48.0	11.793
13	21 24 24.24	1.9828	17 38 58.5	11.858
14	21 26 23.02	1.9768	17 27 5.1	11.921
15	21 28 21.45	1.9708	17 15 8.0	11.983
16	21 30 19.52	1.9650	17 3 7.1	12.046
17	21 32 17.25	1.9593	16 51 2.5	12.106
18	21 34 14.63	1.9535	16 38 54.4	12.165
19	21 36 11.67	1.9479	16 26 42.7	12.223
20	21 38 8.38	1.9423	16 14 27.6	12.281
21	21 40 4.75	1.9368	16 2 9.0	12.337
22	21 42 0.80	1.9314	15 49 47.2	12.392
23	21 43 56.52	1.9260	15 37 22.0	12.447
24	21 45 51.92	1.9208	S. 15 24 53.6	12.500

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Dif fo 1 Mi
	SUNDAY 19.			
	h m s	s	° ′ ″	″
0	21 45 51.92	1.9208	S. 15 24 53.6	12.5
1	21 47 47.01	1.9156	15 12 22.0	12.5
2	21 49 41.79	1.9104	14 59 47.4	12.6
3	21 51 36.26	1.9053	14 47 9.7	12.6
4	21 53 30.42	1.9003	14 34 29.1	12.7
5	21 55 24.29	1.8954	14 21 45.5	12.7
6	21 57 17.87	1.8906	14 8 59.1	12.7
7	21 59 11.16	1.8858	13 56 9.9	12.8
8	22 1 4.16	1.8811	13 43 17.9	12.8
9	22 2 56.89	1.8765	13 30 23.2	12.9
10	22 4 49.34	1.8719	13 17 25.9	12.9
11	22 6 41.52	1.8674	13 4 26.0	13.0
12	22 8 33.43	1.8630	12 51 23.6	13.0
13	22 10 25.08	1.8587	12 38 18.7	13.1
14	22 12 16.47	1.8544	12 25 11.4	13.1
15	22 14 7.61	1.8502	12 12 1.8	13.1
16	22 15 58.49	1.8461	11 58 49.8	13.2
17	22 17 49.14	1.8421	11 45 35.6	13.2
18	22 19 39.54	1.8381	11 32 19.2	13.2
19	22 21 29.71	1.8343	11 19 0.7	13.3
20	22 23 19.65	1.8304	11 5 40.1	13.3
21	22 25 9.36	1.8267	10 52 17.4	13.3
22	22 26 58.85	1.8230	10 38 52.8	13.4
23	22 28 48.12	1.8194	S. 10 25 26.2	13.4
	MONDAY 20.			
0	22 30 37.18	1.8159	S. 10 11 57.7	13.49
1	22 32 26.03	1.8125	9 58 27.4	13.52
2	22 34 14.68	1.8092	9 44 55.3	13.54
3	22 36 3.13	1.8058	9 31 21.5	13.57
4	22 37 51.38	1.8026	9 17 45.9	13.60
5	22 39 39.44	1.7995	9 4 8.7	13.63
6	22 41 27.32	1.7964	8 50 30.0	13.65
7	22 43 15.01	1.7934	8 36 49.7	13.68
8	22 45 2.53	1.7906	8 23 7.9	13.70
9	22 46 49.88	1.7878	8 9 24.6	13.73
10	22 48 37.06	1.7849	7 55 40.0	13.75
11	22 50 24.07	1.7823	7 41 53.9	13.77
12	22 52 10.93	1.7797	7 28 6.6	13.79
13	22 53 57.63	1.7771	7 14 18.0	13.81
14	22 55 44.18	1.7747	7 0 28.2	13.83
15	22 57 30.59	1.7723	6 46 37.3	13.85
16	22 59 16.85	1.7699	6 32 45.2	13.87
17	23 1 2.98	1.7678	6 18 52.0	13.89
18	23 2 48.98	1.7656	6 4 57.8	13.91
19	23 4 34.85	1.7634	5 51 2.6	13.92
20	23 6 20.59	1.7614	5 37 6.5	13.94
21	23 8 6.22	1.7595	5 23 9.4	13.95
22	23 9 51.73	1.7576	5 9 11.5	13.97
23	23 11 37.13	1.7558	4 55 12.8	13.98
24	23 13 22.43	1.7541	S. 4 41 13.4	13.99

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	23 13 22.43	1.7541	S. 4 41 13.4	13.996
1	23 15 7.62	1.7524	4 27 13.3	14.008
2	23 16 52.72	1.7509	4 13 12.4	14.020
3	23 18 37.73	1.7494	3 59 10.9	14.030
4	23 20 22.65	1.7480	3 45 8.8	14.039
5	23 22 7.49	1.7466	3 31 6.2	14.048
6	23 23 52.24	1.7453	3 17 3.1	14.056
7	23 25 36.92	1.7441	3 2 59.5	14.063
8	23 27 21.53	1.7429	2 48 55.5	14.070
9	23 29 6.07	1.7418	2 34 51.1	14.076
10	23 30 50.55	1.7409	2 20 46.4	14.081
11	23 32 34.98	1.7400	2 6 41.4	14.085
12	23 34 19.35	1.7391	1 52 36.2	14.088
13	23 36 3.67	1.7383	1 38 30.8	14.092
14	23 37 47.95	1.7377	1 24 25.2	14.094
15	23 39 32.19	1.7370	1 10 19.5	14.096
16	23 41 16.39	1.7364	0 56 13.7	14.097
17	23 43 0.56	1.7359	0 42 7.9	14.096
18	23 44 44.70	1.7355	0 28 2.2	14.095
19	23 46 28.82	1.7351	S. 0 13 56.5	14.095
20	23 48 12.91	1.7348	N. 0 0 9.2	14.093
21	23 49 56.99	1.7347	0 14 14.7	14.090
22	23 51 41.07	1.7345	0 28 20.0	14.087
23	23 53 25.13	1.7343	N. 0 42 25.1	14.083

WEDNESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	23 55 9.19	1.7344	N. 0 56 29.9	14.078
1	23 56 53.26	1.7345	1 10 34.4	14.072
2	23 58 37.33	1.7346	1 24 38.5	14.065
3	0 0 21.41	1.7348	1 38 42.2	14.058
4	0 2 5.51	1.7351	1 52 45.5	14.052
5	0 3 49.62	1.7354	2 6 48.4	14.043
6	0 5 33.76	1.7358	2 20 50.7	14.033
7	0 7 17.92	1.7363	2 34 52.4	14.023
8	0 9 2.11	1.7368	2 48 53.5	14.013
9	0 10 46.34	1.7375	3 2 53.9	14.001
10	0 12 30.61	1.7382	3 16 53.6	13.989
11	0 14 14.92	1.7389	3 30 52.6	13.977
12	0 15 59.28	1.7398	3 44 50.8	13.963
13	0 17 43.69	1.7406	3 58 48.2	13.949
14	0 19 28.15	1.7416	4 12 44.7	13.934
15	0 21 12.68	1.7427	4 26 40.3	13.918
16	0 22 57.27	1.7437	4 40 34.9	13.902
17	0 24 41.92	1.7448	4 54 28.5	13.885
18	0 26 26.65	1.7461	5 8 21.1	13.868
19	0 28 11.45	1.7473	5 22 12.6	13.848
20	0 29 56.33	1.7488	5 36 2.9	13.829
21	0 31 41.30	1.7502	5 49 52.1	13.810
22	0 33 26.35	1.7516	6 3 40.1	13.788
23	0 35 11.49	1.7532	6 17 26.7	13.766
24	0 36 56.73	1.7548	N. 6 31 12.0	13.743

THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	0 36 56.73	1.7548	N. 6 31 12.0	13.743
1	0 38 42.07	1.7565	6 44 55.9	13.721
2	0 40 27.51	1.7583	6 58 38.5	13.698
3	0 42 13.06	1.7601	7 12 19.6	13.673
4	0 43 58.72	1.7619	7 25 59.2	13.647
5	0 45 44.49	1.7638	7 39 37.2	13.621
6	0 47 30.38	1.7659	7 53 13.7	13.594
7	0 49 16.40	1.7680	8 6 48.5	13.567
8	0 51 2.54	1.7701	8 20 21.7	13.538
9	0 52 48.81	1.7723	8 33 53.1	13.508
10	0 54 35.21	1.7745	8 47 22.7	13.478
11	0 56 21.75	1.7769	9 0 50.5	13.448
12	0 58 8.44	1.7793	9 14 16.5	13.417
13	0 59 55.27	1.7818	9 27 40.5	13.383
14	1 1 42.25	1.7843	9 41 2.5	13.351
15	1 3 29.38	1.7868	9 54 22.6	13.317
16	1 5 16.66	1.7894	10 7 40.5	13.282
17	1 7 4.11	1.7922	10 20 56.4	13.247
18	1 8 51.72	1.7949	10 34 10.1	13.210
19	1 10 39.50	1.7978	10 47 21.6	13.173
20	1 12 27.45	1.8006	11 0 30.8	13.134
21	1 14 15.57	1.8035	11 13 37.7	13.096
22	1 16 3.87	1.8065	11 26 42.3	13.056
23	1 17 52.35	1.8096	N. 11 39 44.4	13.015

FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	1 19 41.02	1.8128	N. 11 52 44.1	12.974
1	1 21 29.88	1.8159	12 5 41.3	12.932
2	1 23 18.93	1.8191	12 18 35.9	12.888
3	1 25 8.17	1.8223	12 31 27.9	12.845
4	1 26 57.61	1.8258	12 44 17.3	12.800
5	1 28 47.26	1.8292	12 57 3.9	12.754
6	1 30 37.11	1.8326	13 9 47.8	12.708
7	1 32 27.17	1.8362	13 22 28.9	12.661
8	1 34 17.45	1.8398	13 35 7.1	12.613
9	1 36 7.94	1.8433	13 47 42.4	12.563
10	1 37 58.65	1.8470	14 0 14.7	12.513
11	1 39 49.58	1.8507	14 12 43.9	12.462
12	1 41 40.73	1.8544	14 25 10.1	12.410
13	1 43 32.11	1.8583	14 37 33.1	12.358
14	1 45 23.73	1.8623	14 49 53.0	12.305
15	1 47 15.58	1.8661	15 2 9.7	12.250
16	1 49 7.66	1.8701	15 14 23.0	12.194
17	1 50 59.99	1.8742	15 26 33.0	12.138
18	1 52 52.56	1.8783	15 38 39.6	12.081
19	1 54 45.38	1.8824	15 50 42.7	12.023
20	1 56 38.45	1.8866	16 2 42.3	11.963
21	1 58 31.77	1.8908	16 14 38.3	11.903
22	2 0 25.35	1.8952	16 26 30.7	11.843
23	2 2 19.19	1.8994	16 38 19.4	11.781
24	2 4 13.28	1.9038	N. 16 50 4.4	11.718

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
	SATURDAY 25.								
	h	m	s	s		°	′	″	″
0	2	4	13.28	1.9038	N.	16	50	4.4	11.718
1	2	6	7.64	1.9082		17	1	45.6	11.654
2	2	8	2.26	1.9127		17	13	22.9	11.589
3	2	9	57.16	1.9173		17	24	56.3	11.523
4	2	11	52.33	1.9218		17	36	25.7	11.458
5	2	13	47.77	1.9263		17	47	51.2	11.390
6	2	15	43.49	1.9310		17	59	12.5	11.321
7	2	17	39.49	1.9357		18	10	29.7	11.252
8	2	19	35.77	1.9403		18	21	42.7	11.182
9	2	21	32.33	1.9451		18	32	51.5	11.110
10	2	23	29.18	1.9499		18	43	55.9	11.038
11	2	25	26.32	1.9547		18	54	56.0	10.964
12	2	27	23.74	1.9595		19	5	51.6	10.889
13	2	29	21.46	1.9644		19	16	42.7	10.814
14	2	31	19.47	1.9693		19	27	29.3	10.738
15	2	33	17.78	1.9743		19	38	11.3	10.661
16	2	35	16.39	1.9793		19	48	48.6	10.583
17	2	37	15.30	1.9843		19	59	21.2	10.503
18	2	39	14.51	1.9893		20	9	49.0	10.423
19	2	41	14.02	1.9944		20	20	11.9	10.341
20	2	43	13.84	1.9995		20	30	29.9	10.258
21	2	45	13.96	2.0047		20	40	42.9	10.175
22	2	47	14.40	2.0098		20	50	50.9	10.091
23	2	49	15.14	2.0149	N.	21	0	53.8	10.005
	SUNDAY 26.								
0	2	51	16.19	2.0202	N.	21	10	51.5	9.918
1	2	53	17.56	2.0254		21	20	44.0	9.831
2	2	55	19.24	2.0306		21	30	31.2	9.743
3	2	57	21.23	2.0358		21	40	13.1	9.653
4	2	59	23.54	2.0411		21	49	49.6	9.563
5	3	1	26.16	2.0463		21	59	20.6	9.471
6	3	3	29.10	2.0517		22	8	46.1	9.378
7	3	5	32.36	2.0570		22	18	6.0	9.284
8	3	7	35.94	2.0623		22	27	20.2	9.190
9	3	9	39.84	2.0677		22	36	28.8	9.095
10	3	11	44.06	2.0730		22	45	31.6	8.998
11	3	13	48.60	2.0783		22	54	28.5	8.899
12	3	15	53.46	2.0837		23	3	19.5	8.801
13	3	17	58.64	2.0890		23	12	4.6	8.701
14	3	20	4.14	2.0943		23	20	43.6	8.599
15	3	22	9.96	2.0997		23	29	16.5	8.498
16	3	24	16.10	2.1050		23	37	43.3	8.395
17	3	26	22.56	2.1103		23	46	3.9	8.291
18	3	28	29.34	2.1157		23	54	18.2	8.186
19	3	30	36.44	2.1210		24	2	26.2	8.080
20	3	32	43.86	2.1263		24	10	27.8	7.973
21	3	34	51.60	2.1317		24	18	22.9	7.864
22	3	36	59.66	2.1369		24	26	11.5	7.755
23	3	39	8.03	2.1422		24	33	53.5	7.645
24	3	41	16.72	2.1475	N.	24	41	28.9	7.534

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
	MONDAY 27.								
	h	m	s	s		°	′	″	″
0	3	41	16.72	2.1475	N.	24	41	28.9	7.534
1	3	43	25.73	2.1528		24	48	57.6	7.422
2	3	45	35.05	2.1579		24	56	19.5	7.308
3	3	47	44.68	2.1632		25	3	34.6	7.195
4	3	49	54.63	2.1684		25	10	42.9	7.080
5	3	52	4.89	2.1735		25	17	44.2	6.963
6	3	54	15.45	2.1786		25	24	38.5	6.846
7	3	56	26.32	2.1838		25	31	25.7	6.728
8	3	58	37.50	2.1888		25	38	5.9	6.610
9	4	0	48.98	2.1939		25	44	38.9	6.489
10	4	3	0.77	2.1990		25	51	4.6	6.368
11	4	5	12.86	2.2039		25	57	23.0	6.246
12	4	7	25.24	2.2088		26	3	34.1	6.123
13	4	9	37.92	2.2138		26	9	37.8	5.999
14	4	11	50.89	2.2186		26	15	34.0	5.874
15	4	14	4.15	2.2234		26	21	22.7	5.749
16	4	16	17.70	2.2283		26	27	3.9	5.623
17	4	18	31.54	2.2330		26	32	37.4	5.495
18	4	20	45.66	2.2376		26	38	3.3	5.367
19	4	23	0.05	2.2422		26	43	21.4	5.237
20	4	25	14.72	2.2468		26	48	31.7	5.107
21	4	27	29.67	2.2513		26	53	34.2	4.976
22	4	29	44.88	2.2558		26	58	28.8	4.844
23	4	32	0.36	2.2603	N.	27	3	15.5	4.711
	TUESDAY 28.								
0	4	34	16.11	2.2646	N.	27	7	54.1	4.577
1	4	36	32.11	2.2688		27	12	24.7	4.443
2	4	38	48.37	2.2731		27	16	47.2	4.308
3	4	41	4.88	2.2773		27	21	1.6	4.172
4	4	43	21.64	2.2813		27	25	7.8	4.035
5	4	45	38.64	2.2853		27	29	5.8	3.898
6	4	47	55.88	2.2893		27	32	55.5	3.758
7	4	50	13.35	2.2932		27	36	36.8	3.618
8	4	52	31.06	2.2970		27	40	9.7	3.479
9	4	54	48.99	2.3007		27	43	34.3	3.339
10	4	57	7.14	2.3043		27	46	50.4	3.198
11	4	59	25.51	2.3080		27	49	58.0	3.055
12	5	1	44.10	2.3115		27	52	57.0	2.913
13	5	4	2.89	2.3149		27	55	47.5	2.769
14	5	6	21.89	2.3183		27	58	29.3	2.625
15	5	8	41.08	2.3214		28	1	2.5	2.480
16	5	11	0.46	2.3246		28	3	26.9	2.334
17	5	13	20.03	2.3278		28	5	42.6	2.189
18	5	15	39.79	2.3308		28	7	49.6	2.043
19	5	17	59.72	2.3337		28	9	47.7	1.895
20	5	20	19.83	2.3365		28	11	37.0	1.748
21	5	22	40.10	2.3393		28	13	17.5	1.600
22	5	25	0.54	2.3419		28	14	49.0	1.451
23	5	27	21.13	2.3444		28	16	11.6	1.302
24	5	29	41.87	2.3468	N.	28	17	25.2	1.152

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 29.			
	h m s	s	° ′ ″	″
0	5 29 41.87	2.3468	N. 28 17 25.2	1.152
1	5 32 2.75	2.3493	28 18 29.8	1.002
2	5 34 23.78	2.3516	28 19 25.4	0.851
3	5 36 44.94	2.3538	28 20 11.9	0.700
4	5 39 6.23	2.3558	28 20 49.4	0.549
5	5 41 27.63	2.3577	28 21 17.8	0.397
6	5 43 49.15	2.3597	28 21 37.0	0.244
7	5 46 10.79	2.3615	28 21 47.1	+0.092
8	5 48 32.53	2.3631	28 21 48.0	−0.061
9	5 50 54.36	2.3647	28 21 39.8	0.214
10	5 53 16.29	2.3662	28 21 22.3	0.368
11	5 55 38.30	2.3676	28 20 55.6	0.522
12	5 58 0.40	2.3689	28 20 19.7	0.676
13	6 0 22.57	2.3701	28 19 34.5	0.830
14	6 2 44.81	2.3712	28 18 40.1	0.984
15	6 5 7.11	2.3722	28 17 36.4	1.139
16	6 7 29.47	2.3730	28 16 23.4	1.293
17	6 9 51.87	2.3738	28 15 1.2	1.448
18	6 12 14.32	2.3745	28 13 29.6	1.604
19	6 14 36.81	2.3751	28 11 48.7	1.760
20	6 16 59.33	2.3756	28 9 58.4	1.915
21	6 19 21.88	2.3760	28 7 58.9	2.070
22	6 21 44.45	2.3763	28 5 50.0	2.226
23	6 24 7.04	2.3765	N. 28 3 31.8	2.382
	THURSDAY 30.			
0	6 26 29.63	2.3766	N. 28 1 4.2	2.538
1	6 28 52.23	2.3766	27 58 27.3	2.693
2	6 31 14.82	2.3764	27 55 41.1	2.848
3	6 33 37.40	2.3763	27 52 45.5	3.003
4	6 35 59.97	2.3760	27 49 40.7	3.158
5	6 38 22.52	2.3756	27 46 26.5	3.314
6	6 40 45.04	2.3751	27 43 3.0	3.469
7	6 43 7.53	2.3746	27 39 30.2	3.624
8	6 45 29.99	2.3739	27 35 48.1	3.779
9	6 47 52.40	2.3731	27 31 56.7	3.934
10	6 50 14.76	2.3723	27 27 56.0	4.089
11	6 52 37.07	2.3714	27 23 46.0	4.243
12	6 54 59.33	2.3704	27 19 26.8	4.397
13	6 57 21.52	2.3693	27 14 58.4	4.551
14	6 59 43.64	2.3681	27 10 20.7	4.705
15	7 2 5.69	2.3668	27 5 33.8	4.858
16	7 4 27.66	2.3655	27 0 37.7	5.012
17	7 6 49.55	2.3642	26 55 32.4	5.164
18	7 9 11.36	2.3627	26 50 18.0	5.316
19	7 11 33.07	2.3610	26 44 54.5	5.468
20	7 13 54.68	2.3594	26 39 21.9	5.619
21	7 16 16.20	2.3578	26 33 40.2	5.771
22	7 18 37.61	2.3559	26 27 49.4	5.922
23	7 20 58.91	2.3540	26 21 49.6	6.073
24	7 23 20.09	2.3521	N. 26 15 40.7	6.223

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY, MAY 1.			
	h m s	s	° ′ ″	″
0	7 23 20.09	2.3521	N. 26 15 40.7	6.223

PHASES OF THE MOON.

			d	h	m
☽	First Quarter	Apr.	3	7	41.5
○	Full Moon		10	1	28.2
☾	Last Quarter		16	19	52.2
●	New Moon		24	23	21.9

			d	h
☾	Perigee	Apr.	9	21.9
☾	Apogee		23	5.8

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	2 31 22.68	9.531	N.14 54 17.4	+45.74	15 53.98	65.99	2 53.69	0.324
Sat.	2	2 35 11.69	9.553	15 12 27.6	45.11	15 53.75	66.07	3 1.21	0.302
SUN.	3	2 39 1.23	9.575	15 30 22.7	44.47	15 53.52	66.15	3 8.21	0.280
Mon.	4	2 42 51.29	9.597	15 48 2.3	+43.82	15 53.30	66.23	3 14.69	0.258
Tues.	5	2 46 41.88	9.620	16 5 26.0	43.16	15 53.08	66.31	3 20.64	0.236
Wed.	6	2 50 33.02	9.642	16 22 33.8	42.49	15 52.86	66.39	3 26.04	0.214
Thur.	7	2 54 24.71	9.665	16 39 25.2	+41.80	15 52.64	66.47	3 30.89	0.191
Frid.	8	2 58 16.96	9.688	16 56 0.0	41.10	15 52.42	66.55	3 35.19	0.168
Sat.	9	3 2 9.77	9.712	17 12 17.8	40.39	15 52.20	66.63	3 38.93	0.144
SUN.	10	3 6 3.14	9.736	17 28 18.5	+39.67	15 51.98	66.72	3 42.10	0.120
Mon.	11	3 9 57.09	9.760	17 44 1.8	38.94	15 51.76	66.80	3 44.70	0.096
Tues.	12	3 13 51.63	9.784	17 59 27.4	38.19	15 51.55	66.88	3 46.72	0.072
Wed.	13	3 17 46.76	9.809	18 14 35.0	+37.43	15 51.34	66.96	3 48.14	0.047
Thur.	14	3 21 42.47	9.834	18 29 24.3	36.67	15 51.13	67.04	3 48.97	0.023
Frid.	15	3 25 38.78	9.859	18 43 55.1	35.90	15 50.92	67.12	3 49.22	0.002
Sat.	16	3 29 35.68	9.883	18 58 7.0	+35.11	15 50.72	67.20	3 48.88	0.027
SUN.	17	3 33 33.17	9.908	19 11 59.8	34.29	15 50.52	67.28	3 47.95	0.051
Mon.	18	3 37 31.25	9.932	19 25 33.2	33.47	15 50.32	67.36	3 46.44	0.075
Tues.	19	3 41 29.90	9.955	19 38 46.9	+32.65	15 50.13	67.44	3 44.36	0.099
Wed.	20	3 45 29.12	9.979	19 51 40.6	31.81	15 49.94	67.52	3 41.70	0.122
Thur.	21	3 49 28.90	10.002	20 4 14.0	30.96	15 49.75	67.60	3 38.48	0.145
Frid.	22	3 53 29.23	10.025	20 16 26.9	+30.10	15 49.57	67.67	3 34.71	0.168
Sat.	23	3 57 30.11	10.048	20 28 19.1	29.23	15 49.39	67.75	3 30.40	0.191
SUN.	24	4 1 31.52	10.070	20 39 50.2	28.35	15 49.22	67.82	3 25.55	0.213
Mon.	25	4 5 33.46	10.091	20 50 59.9	+27.46	15 49.05	67.89	3 20.19	0.234
Tues.	26	4 9 35.90	10.112	21 1 48.2	26.56	15 48.89	67.96	3 14.32	0.255
Wed.	27	4 13 38.84	10.132	21 12 14.7	25.64	15 48.73	68.03	3 7.97	0.275
Thur.	28	4 17 42.24	10.151	21 22 19.2	+24.72	15 48.57	68.10	3 1.15	0.294
Frid.	29	4 21 46.10	10.170	21 32 1.5	23.79	15 48.42	68.16	2 53.87	0.313
Sat.	30	4 25 50.40	10.188	21 41 21.3	22.85	15 48.28	68.22	2 46.14	0.331
SUN.	31	4 29 55.13	10.205	21 50 18.5	21.91	15 48.14	68.28	2 37.99	0.348
Mon.	32	4 34 0.27	10.221	N.21 58 52.9	+20.95	15 48.01	68.34	2 29.44	0.364

**NOTE.—The mean time of semidiameter passing meridian may be found by subtracting $0^s.18$ from the sidereal time.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.**

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	2 31 23.14	9.532	N.14 54 19.7	+45.74	2 53.71	0.324	2 34 16.84
Sat.	2	2 35 12.17	9.554	15 12 29.9	45.11	3 1.23	0.302	2 38 13.40
SUN.	3	2 39 1.72	9.576	15 30 25.0	44.47	3 8.23	0.280	2 42 9.96
Mon.	4	2 42 51.80	9.598	15 48 4.6	+43.82	3 14.70	0.258	2 46 6.51
Tues.	5	2 46 42.42	9.620	16 5 28.4	43.16	3 20.64	0.236	2 50 3.07
Wed.	6	2 50 33.58	9.643	16 22 36.2	42.49	3 26.04	0.214	2 53 59.62
Thur.	7	2 54 25.28	9.666	16 39 27.6	+41.80	3 30.90	0.191	2 57 56.18
Frid.	8	2 58 17.54	9.689	16 56 2.4	41.10	3 35.20	0.168	3 1 52.74
Sat.	9	3 2 10.36	9.713	17 12 20.3	40.39	3 38.94	0.144	3 5 49.29
SUN.	10	3 6 3.74	9.737	17 28 21.0	+39.67	3 42.11	0.120	3 9 45.85
Mon.	11	3 9 57.70	9.761	17 44 4.3	38.93	3 44.71	0.096	3 13 42.40
Tues.	12	3 13 52.25	9.785	17 59 29.8	38.18	3 46.72	0.072	3 17 38.96
Wed.	13	3 17 47.38	9.809	18 14 37.3	+37.43	3 48.14	0.047	3 21 35.52
Thur.	14	3 21 43.10	9.834	18 29 26.6	36.67	3 48.97	0.023	3 25 32.08
Frid.	15	3 25 39.41	9.859	18 43 57.4	35.90	3 49.22	0.002	3 29 28.63
Sat.	16	3 29 36.31	9.883	18 58 9.3	+35.10	3 48.88	0.027	3 33 25.19
SUN.	17	3 33 33.80	9.907	19 12 2.0	34.29	3 47.95	0.051	3 37 21.75
Mon.	18	3 37 31.87	9.931	19 25 35.3	33.47	3 46.44	0.075	3 41 18.30
Tues.	19	3 41 30.51	9.955	19 38 48.9	+32.65	3 44.35	0.099	3 45 14.86
Wed.	20	3 45 29.72	9.979	19 51 42.5	31.81	3 41.69	0.122	3 49 11.42
Thur.	21	3 49 29.50	10.002	20 4 15.9	30.96	3 38.47	0.145	3 53 7.98
Frid.	22	3 53 29.83	10.025	20 16 28.7	+30.10	3 34.70	0.168	3 57 4.53
Sat.	23	3 57 30.70	10.047	20 28 20.8	29.23	3 30.39	0.191	4 1 1.09
SUN.	24	4 1 32.10	10.069	20 39 51.8	28.35	3 25.54	0.213	4 4 57.65
Mon.	25	4 5 34.02	10.091	20 51 1.5	+27.46	3 20.17	0.234	4 8 54.20
Tues.	26	4 9 36.45	10.111	21 1 49.6	26.56	3 14.31	0.255	4 12 50.76
Wed.	27	4 13 39.37	10.131	21 12 16.0	25.64	3 7.96	0.275	4 16 47.32
Thur.	28	4 17 42.75	10.150	21 22 20.4	+24.72	3 1.13	0.294	4 20 43.88
Frid.	29	4 21 46.59	10.169	21 32 2.6	23.79	2 53.85	0.313	4 24 40.44
Sat.	30	4 25 50.87	10.187	21 41 22.4	22.85	2 46.12	0.331	4 28 37.00
SUN.	31	4 29 55.58	10.205	21 50 19.5	21.91	2 37.97	0.348	4 32 33.55
Mon.	32	4 34 0.69	10.221	N.21 58 53.8	+20.95	2 29.42	0.364	4 36 30.11

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S							Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		True Longitude.					Diff. for 1 Hour.	Latitude.					
		λ			λ′								
		°	′	″	′	″	″	″			h	m	s
1	121	40	16	6.5	15	45.9	145.55	+0.66	0.003 4056	+44.2	21	22	12.52
2	122	41	14	18.6	13	57.8	145.47	0.56	0.003 5110	43.7	21	18	16.61
3	123	42	12	28.7	12	7.8	145.38	0.45	0.003 6152	43.2	21	14	20.70
4	124	43	10	36.8	10	15.7	145.29	+0.32	0.003 7184	+42.8	21	10	24.79
5	125	44	8	42.8	8	21.6	145.21	0.18	0.003 8206	42.4	21	6	28.88
6	126	45	6	46.9	6	25.5	145.13	+0.05	0.003 9220	42.1	21	2	32.97
7	127	46	4	49.1	4	27.6	145.05	−0.07	0.004 0227	+41.8	20	58	37.06
8	128	47	2	49.5	2	27.9	144.98	0.18	0.004 1227	41.5	20	54	41.15
9	129	48	0	48.2	0	26.4	144.91	0.26	0.004 2221	41.3	20	50	45.24
10	130	48	58	45.3	58	23.3	144.84	−0.31	0.004 3209	+41.0	20	46	49.33
11	131	49	56	40.8	56	18.7	144.78	0.34	0.004 4191	40.7	20	42	53.42
12	132	50	54	34.9	54	12.6	144.72	0.34	0.004 5166	40.4	20	38	57.51
13	133	51	52	27.7	52	5.2	144.67	−0.30	0.004 6133	+40.1	20	35	1.60
14	134	52	50	19.2	49	56.6	144.62	0.23	0.004 7090	39.7	20	31	5.69
15	135	53	48	9.5	47	46.7	144.57	0.14	0.004 8036	39.3	20	27	9.78
16	136	54	45	58.6	45	35.6	144.52	−0.03	0.004 8969	+38.7	20	23	13.86
17	137	55	43	46.6	43	23.4	144.47	+0.08	0.004 9888	38.0	20	19	17.95
18	138	56	41	33.4	41	10.1	144.42	0.20	0.005 0792	37.3	20	15	22.04
19	139	57	39	19.0	38	55.6	144.38	+0.33	0.005 1678	+36.6	20	11	26.13
20	140	58	37	3.5	36	39.9	144.33	0.44	0.005 2548	35.8	20	7	30.22
21	141	59	34	46.9	34	23.1	144.28	0.55	0.005 3399	35.0	20	3	34.31
22	142	60	32	29.2	32	5.2	144.23	+0.63	0.005 4230	+34.1	19	59	38.40
23	143	61	30	10.2	29	46.1	144.19	0.70	0.005 5040	33.2	19	55	42.48
24	144	62	27	50.1	27	25.8	144.14	0.75	0.005 5829	32.4	19	51	46.57
25	145	63	25	28.9	25	4.4	144.09	+0.76	0.005 6597	+31.5	19	47	50.66
26	146	64	23	6.3	22	41.7	144.04	0.75	0.005 7342	30.6	19	43	54.75
27	147	65	20	42.6	20	17.7	143.98	0.70	0.005 8065	29.7	19	39	58.84
28	148	66	18	17.5	17	52.5	143.93	+0.64	0.005 8767	+28.8	19	36	2.93
29	149	67	15	51.1	15	25.9	143.87	0.55	0.005 9447	27.9	19	32	7.01
30	150	68	13	23.4	12	58.0	143.82	0.43	0.006 0106	27.0	19	28	11.10
31	151	69	10	54.4	10	28.8	143.76	0.30	0.006 0745	26.2	19	24	15.19
32	152	70	8	24.0	7	58.3	143.71	+0.16	0.006 1365	+25.5	19	20	19.28

Note.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
$-9^{\mathrm{s}}.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 26.4	15 32.1	56 33.89	+1.704	56 54.96	+1.806	5 0.0	2.26	6.0
2	15 38.2	15 44.5	57 17.19	1.896	57 40.39	1.967	5 53.3	2.18	7.0
3	15 51.0	15 57.6	58 4.30	2.014	58 28.62	2.034	6 44.8	2.10	8.0
4	16 4.3	16 10.8	58 52.97	+2.018	59 16.88	+1.960	7 34.6	2.05	9.0
5	16 17.0	16 22.9	59 39.82	1.857	60 1.24	1.705	8 23.6	2.04	10.0
6	16 28.1	16 32.6	60 20.53	1.501	60 37.07	1.247	9 13.0	2.09	11.0
7	16 36.2	16 38.8	60 50.29	+0.948	60 59.67	+0.610	10 4.2	2.19	12.0
8	16 40.2	16 40.4	61 4.82	+0.244	61 5.45	−0.140	10 58.5	2.34	13.0
9	16 39.3	16 36.9	61 1.44	−0.527	60 52.84	0.904	11 56.7	2.51	14.0
10	16 33.4	16 28.7	60 39.85	−1.255	60 22.86	−1.569	12 58.6	2.64	15.0
11	16 23.2	16 16.8	60 2.37	1.838	59 38.96	2.054	14 2.4	2.66	16.0
12	16 9.8	16 2.4	59 13.29	2.214	58 46.04	2.317	15 5.2	2.56	17.0
13	15 54.7	15 46.9	58 17.89	−2.365	57 49.48	−2.362	16 4.3	2.36	18.0
14	15 39.3	15 31.9	57 21.38	2.315	56 54.09	2.227	16 58.2	2.13	19.0
15	15 24.8	15 18.1	56 28.07	2.105	56 3.67	1.957	17 46.9	1.93	20.0
16	15 12.0	15 6.4	55 41.18	−1.788	55 20.81	−1.604	18 31.3	1.78	21.0
17	15 1.5	14 57.2	55 2.72	1.409	54 47.02	1.208	19 12.6	1.67	22.0
18	14 53.6	14 50.6	54 33.73	1.006	54 22.87	0.804	19 52.0	1.62	23.0
19	14 48.3	14 46.7	54 14.41	−0.607	54 8.27	−0.417	20 30.8	1.62	24.0
20	14 45.6	14 45.1	54 4.37	−0.234	54 2.61	−0.061	21 10.2	1.67	25.0
21	14 45.2	14 45.8	54 2.85	+0.100	54 4.95	+0.249	21 51.3	1.76	26.0
22	14 46.8	14 48.3	54 8.77	+0.386	54 14.17	+0.511	22 35.0	1.88	27.0
23	14 50.1	14 52.3	54 20.99	0.624	54 29.11	0.727	23 21.9	2.03	28.0
24	14 54.9	14 57.7	54 38.39	0.818	54 48.70	0.899	☌	. .	29.0
25	15 0.8	15 4.0	54 59.93	+0.972	55 12.00	+1.038	0 12.3	2.17	0.4
26	15 7.5	15 11.2	55 24.83	1.099	55 38.35	1.154	1 5.7	2.27	1.4
27	15 15.1	15 19.1	55 52.52	1.207	56 7.31	1.258	2 0.9	2.31	2.4
28	15 23.3	15 27.6	56 22.69	+1.305	56 38.62	+1.350	2 56.1	2.28	3.4
29	15 32.1	15 36.8	56 55.09	1.394	57 12.06	1.434	3 49.8	2.19	4.4
30	15 41.5	15 46.3	57 29.48	1.467	57 47.24	1.491	4 41.2	2.10	5.4
31	15 51.2	15 56.2	58 5.22	1.504	58 23.28	1.503	5 30.5	2.02	6.4
32	16 1.0	16 5.8	58 41.22	+1.483	58 58.78	+1.439	6 18.3	1.97	7.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 1.					SUNDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 23 20.09	2.3521	N. 26 15 40.7	6.223	0	9 13 10.13	2.2170	N. 18 36 21.1	12.611
1	7 25 41.16	2.3501	26 9 22.9	6.372	1	9 15 23.06	2.2141	18 23 41.1	12.723
2	7 28 2.10	2.3480	26 2 56.1	6.521	2	9 17 35.82	2.2113	18 10 54.4	12.833
3	7 30 22.92	2.3458	25 56 20.4	6.669	3	9 19 48.41	2.2084	17 58 1.2	12.941
4	7 32 43.60	2.3437	25 49 35.8	6.818	4	9 22 0.83	2.2057	17 45 1.5	13.049
5	7 35 4.16	2.3415	25 42 42.3	6.965	5	9 24 13.09	2.2029	17 31 55.3	13.157
6	7 37 24.58	2.3391	25 35 40.0	7.112	6	9 26 25.18	2.2002	17 18 42.6	13.263
7	7 39 44.85	2.3367	25 28 28.9	7.258	7	9 28 37.11	2.1975	17 5 23.7	13.368
8	7 42 4.98	2.3343	25 21 9.0	7.403	8	9 30 48.88	2.1948	16 51 58.5	13.473
9	7 44 24.97	2.3319	25 13 40.5	7.548	9	9 33 0.49	2.1923	16 38 27.0	13.576
10	7 46 44.81	2.3294	25 6 3.2	7.693	10	9 35 11.95	2.1898	16 24 49.4	13.677
11	7 49 4.50	2.3268	24 58 17.3	7.838	11	9 37 23.26	2.1872	16 11 5.8	13.778
12	7 51 24.03	2.3242	24 50 22.7	7.981	12	9 39 34.41	2.1847	15 57 16.1	13.878
13	7 53 43.40	2.3215	24 42 19.6	8.123	13	9 41 45.42	2.1823	15 43 20.5	13.976
14	7 56 2.61	2.3188	24 34 7.9	8.266	14	9 43 56.28	2.1798	15 29 19.0	14.073
15	7 58 21.66	2.3161	24 25 47.7	8.408	15	9 46 7.00	2.1775	15 15 11.8	14.168
16	8 0 40.54	2.3133	24 17 19.0	8.548	16	9 48 17.58	2.1753	15 0 58.8	14.263
17	8 2 59.26	2.3105	24 8 41.9	8.688	17	9 50 28.03	2.1730	14 46 40.2	14.358
18	8 5 17.80	2.3076	23 59 56.5	8.827	18	9 52 38.34	2.1708	14 32 15.9	14.450
19	8 7 36.17	2.3048	23 51 2.7	8.965	19	9 54 48.52	2.1687	14 17 46.2	14.541
20	8 9 54.37	2.3019	23 42 0.7	9.103	20	9 56 58.58	2.1666	14 3 11.0	14.632
21	8 12 12.40	2.2990	23 32 50.4	9.240	21	9 59 8.51	2.1646	13 48 30.4	14.721
22	8 14 30.25	2.2960	23 23 31.9	9.376	22	10 1 18.33	2.1627	13 33 44.5	14.808
23	8 16 47.92	2.2930	N. 23 14 5.3	9.512	23	10 3 28.03	2.1607	N. 13 18 53.4	14.895
	SATURDAY 2.					MONDAY 4.			
0	8 19 5.41	2.2900	N. 23 4 30.5	9.647	0	10 5 37.61	2.1588	N. 13 3 57.1	14.981
1	8 21 22.72	2.2870	22 54 47.7	9.780	1	10 7 47.09	2.1571	12 48 55.7	15.064
2	8 23 39.85	2.2840	22 44 56.9	9.913	2	10 9 56.46	2.1553	12 33 49.4	15.147
3	8 25 56.80	2.2809	22 34 58.2	10.045	3	10 12 5.73	2.1538	12 18 38.1	15.229
4	8 28 13.56	2.2778	22 24 51.5	10.177	4	10 14 14.91	2.1522	12 3 21.9	15.309
5	8 30 30.14	2.2748	22 14 37.0	10.307	5	10 16 23.99	2.1506	11 48 1.0	15.388
6	8 32 46.54	2.2717	22 4 14.7	10.437	6	10 18 32.98	2.1491	11 32 35.4	15.466
7	8 35 2.74	2.2686	21 53 44.6	10.566	7	10 20 41.88	2.1477	11 17 5.1	15.543
8	8 37 18.77	2.2656	21 43 6.8	10.693	8	10 22 50.70	2.1463	11 1 30.2	15.618
9	8 39 34.61	2.2625	21 32 21.4	10.820	9	10 24 59.44	2.1451	10 45 50.9	15.692
10	8 41 50.27	2.2594	21 21 28.4	10.946	10	10 27 8.11	2.1439	10 30 7.2	15.765
11	8 44 5.74	2.2563	21 10 27.9	11.071	11	10 29 16.71	2.1428	10 14 19.1	15.837
12	8 46 21.02	2.2532	20 59 19.9	11.195	12	10 31 25.25	2.1418	9 58 26.8	15.907
13	8 48 36.12	2.2501	20 48 4.5	11.318	13	10 33 33.72	2.1408	9 42 30.3	15.975
14	8 50 51.03	2.2469	20 36 41.7	11.441	14	10 35 42.14	2.1399	9 26 29.8	16.042
15	8 53 5.75	2.2438	20 25 11.6	11.563	15	10 37 50.51	2.1391	9 10 25.3	16.108
16	8 55 20.29	2.2408	20 13 34.2	11.683	16	10 39 58.83	2.1383	8 54 16.8	16.173
17	8 57 34.65	2.2378	20 1 49.6	11.803	17	10 42 7.10	2.1376	8 38 4.5	16.237
18	8 59 48.83	2.2348	19 49 57.9	11.921	18	10 44 15.34	2.1371	8 21 48.4	16.299
19	9 2 2.83	2.2318	19 37 59.1	12.038	19	10 46 23.55	2.1365	8 5 28.6	16.359
20	9 4 16.65	2.2287	19 25 53.3	12.155	20	10 48 31.72	2.1366	7 49 5.3	16.418
21	9 6 30.28	2.2258	19 13 40.5	12.270	21	10 50 39.87	2.1357	7 32 38.4	16.477
22	9 8 43.74	2.2228	19 1 20.9	12.384	22	10 52 48.00	2.1354	7 16 8.1	16.533
23	9 10 57.02	2.2199	18 48 54.4	12.498	23	10 54 56.12	2.1353	6 59 34.5	16.588
24	9 13 10.13	2.2170	N. 18 36 21.1	12.611	24	10 57 4.23	2.1352	N. 6 42 57.6	16.641

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 5.					**THURSDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 57 4.23	2.1352	N. 6 42 57.6	16.641	0	12 41 2.95	2.2313	S. 7 7 22.0	17.292
1	10 59 12.34	2.1351	6 26 17.6	16.693	1	12 43 16.95	2.2355	7 24 38.6	17.260
2	11 1 20.44	2.1351	6 9 34.5	16.743	2	12 45 31.21	2.2398	7 41 53.2	17.227
3	11 3 28.55	2.1352	5 52 48.4	16.793	3	12 47 45.73	2.2441	7 59 5.8	17.192
4	11 5 36.66	2.1353	5 35 59.4	16.840	4	12 50 0.50	2.2484	8 16 16.2	17.154
5	11 7 44.79	2.1357	5 19 7.6	16.888	5	12 52 15.54	2.2530	8 33 24.3	17.114
6	11 9 52.94	2.1361	5 2 13.1	16.931	6	12 54 30.86	2.2576	8 50 29.9	17.073
7	11 12 1.12	2.1366	4 45 15.9	16.974	7	12 56 46.45	2.2622	9 7 33.0	17.029
8	11 14 9.33	2.1371	4 28 16.2	17.016	8	12 59 2.32	2.2669	9 24 33.4	16.983
9	11 16 17.57	2.1377	4 11 14.0	17.056	9	13 1 18.48	2.2717	9 41 31.0	16.935
10	11 18 25.85	2.1384	3 54 9.5	17.094	10	13 3 34.92	2.2765	9 58 25.6	16.885
11	11 20 34.18	2.1393	3 37 2.7	17.132	11	13 5 51.66	2.2815	10 15 17.2	16.833
12	11 22 42.56	2.1401	3 19 53.7	17.167	12	13 8 8.70	2.2865	10 32 5.6	16.779
13	11 24 50.99	2.1411	3 2 42.7	17.200	13	13 10 26.04	2.2916	10 48 50.7	16.723
14	11 26 59.49	2.1422	2 45 29.7	17.232	14	13 12 43.69	2.2968	11 5 32.3	16.664
15	11 29 8.05	2.1433	2 28 14.9	17.263	15	13 15 1.65	2.3020	11 22 10.4	16.604
16	11 31 16.69	2.1446	2 10 58.2	17.292	16	13 17 19.93	2.3073	11 38 44.8	16.541
17	11 33 25.40	2.1458	1 53 39.9	17.319	17	13 19 38.52	2.3125	11 55 15.3	16.475
18	11 35 34.19	2.1473	1 36 19.9	17.346	18	13 21 57.43	2.3180	12 11 41.8	16.408
19	11 37 43.07	2.1488	1 18 58.4	17.369	19	13 24 16.68	2.3235	12 28 4.3	16.339
20	11 39 52.05	2.1504	1 1 35.6	17.391	20	13 26 36.25	2.3290	12 44 22.5	16.268
21	11 42 1.12	2.1521	0 44 11.5	17.412	21	13 28 56.16	2.3347	13 0 36.4	16.193
22	11 44 10.30	2.1538	0 26 46.2	17.432	22	13 31 16.41	2.3403	13 16 45.7	16.118
23	11 46 19.58	2.1557	N. 0 9 19.7	17.449	23	13 33 37.00	2.3460	S. 13 32 50.5	16.040
	WEDNESDAY 6.					**FRIDAY 8.**			
0	11 48 28.98	2.1578	S. 0 8 7.7	17.464	0	13 35 57.93	2.3518	S. 13 48 50.5	15.959
1	11 50 38.50	2.1598	0 25 36.0	17.478	1	13 38 19.21	2.3576	14 4 45.6	15.876
2	11 52 48.15	2.1618	0 43 5.1	17.490	2	13 40 40.84	2.3635	14 20 35.7	15.792
3	11 54 57.92	2.1640	1 0 34.8	17.500	3	13 43 2.83	2.3694	14 36 20.7	15.705
4	11 57 7.83	2.1664	1 18 5.1	17.509	4	13 45 25.17	2.3753	14 52 0.3	15.616
5	11 59 17.89	2.1688	1 35 35.9	17.516	5	13 47 47.87	2.3813	15 7 34.6	15.525
6	12 1 28.09	2.1713	1 53 7.0	17.521	6	13 50 10.93	2.3874	15 23 3.3	15.431
7	12 3 38.44	2.1738	2 10 38.4	17.524	7	13 52 34.36	2.3935	15 38 26.3	15.335
8	12 5 48.95	2.1765	2 28 9.9	17.526	8	13 54 58.15	2.3996	15 53 43.5	15.237
9	12 7 59.62	2.1793	2 45 41.5	17.526	9	13 57 22.31	2.4058	16 8 54.7	15.136
10	12 10 10.46	2.1822	3 3 13.0	17.523	10	13 59 46.84	2.4119	16 23 59.8	15.033
11	12 12 21.48	2.1852	3 20 44.3	17.519	11	14 2 11.74	2.4182	16 38 58.7	14.929
12	12 14 32.68	2.1882	3 38 15.3	17.513	12	14 4 37.02	2.4243	16 53 51.3	14.823
13	12 16 44.06	2.1913	3 55 45.9	17.505	13	14 7 2.67	2.4306	17 8 37.4	14.713
14	12 18 55.63	2.1945	4 13 15.9	17.495	14	14 9 28.69	2.4369	17 23 16.9	14.602
15	12 21 7.40	2.1978	4 30 45.3	17.484	15	14 11 55.10	2.4433	17 37 49.6	14.488
16	12 23 19.37	2.2012	4 48 14.0	17.471	16	14 14 21.88	2.4495	17 52 15.4	14.372
17	12 25 31.54	2.2046	5 5 41.8	17.455	17	14 16 49.04	2.4558	18 6 34.2	14.254
18	12 27 43.92	2.2082	5 23 8.6	17.437	18	14 19 16.57	2.4621	18 20 45.9	14.134
19	12 29 56.52	2.2118	5 40 34.2	17.418	19	14 21 44.49	2.4685	18 34 50.3	14.012
20	12 32 9.34	2.2156	5 57 58.7	17.397	20	14 24 12.79	2.4748	18 48 47.3	13.887
21	12 34 22.39	2.2194	6 15 21.8	17.373	21	14 26 41.47	2.4811	19 2 36.7	13.760
22	12 36 35.67	2.2233	6 32 43.5	17.348	22	14 29 10.52	2.4873	19 16 18.5	13.632
23	12 38 49.19	2.2273	6 50 3.6	17.321	23	14 31 39.95	2.4937	19 29 52.5	13.501
24	12 41 2.95	2.2313	S. 7 7 22.0	17.292	24	14 34 9.76	2.5000	S. 19 43 18.6	13.368

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 9.					MONDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 34 9.76	2.5000	S. 19 43 18.6	13.368	0	16 40 16.00	2.7128	S. 27 16 58.8	4.9
1	14 36 39.95	2.5063	19 56 36.7	13.233	1	16 42 58.80	2.7138	27 21 51.5	4.7
2	14 39 10.52	2.5126	20 9 46.6	13.096	2	16 45 41.65	2.7146	27 26 32.0	4.5
3	14 41 41.46	2.5188	20 22 48.2	12.957	3	16 48 24.55	2.7153	27 31 0.4	4.31
4	14 44 12.78	2.5250	20 35 41.4	12.816	4	16 51 7.48	2.7158	27 35 16.6	4.1
5	14 46 44.46	2.5312	20 48 26.1	12.673	5	16 53 50.44	2.7161	27 39 20.6	3.9
6	14 49 16.52	2.5373	21 1 2.1	12.527	6	16 56 33.41	2.7162	27 43 12.3	3.7
7	14 51 48.94	2.5434	21 13 29.3	12.379	7	16 59 16.38	2.7162	27 46 51.9	3.55
8	14 54 21.73	2.5495	21 25 47.6	12.231	8	17 1 59.35	2.7159	27 50 19.3	3.3
9	14 56 54.88	2.5556	21 37 57.0	12.080	9	17 4 42.29	2.7154	27 53 34.5	3.1
10	14 59 28.40	2.5616	21 49 57.2	11.926	10	17 7 25.20	2.7148	27 56 37.4	2.94
11	15 2 2.27	2.5674	22 1 48.1	11.770	11	17 10 8.07	2.7140	27 59 28.1	2.74
12	15 4 36.49	2.5733	22 13 29.6	11.613	12	17 12 50.88	2.7129	28 2 6.6	2.54
13	15 7 11.06	2.5791	22 25 1.7	11.455	13	17 15 33.62	2.7117	28 4 32.9	2.33
14	15 9 45.98	2.5848	22 36 24.2	11.294	14	17 18 16.28	2.7103	28 6 47.0	2.13
15	15 12 21.24	2.5905	22 47 37.0	11.132	15	17 20 58.85	2.7086	28 8 49.0	1.93
16	15 14 56.84	2.5961	22 58 40.0	10.967	16	17 23 41.31	2.7068	28 10 38.8	1.72
17	15 17 32.77	2.6016	23 9 33.0	10.801	17	17 26 23.66	2.7048	28 12 16.5	1.52
18	15 20 9.03	2.6070	23 20 16.1	10.634	18	17 29 5.88	2.7026	28 13 42.1	1.32
19	15 22 45.61	2.6123	23 30 49.1	10.464	19	17 31 47.97	2.7002	28 14 55.6	1.12
20	15 25 22.51	2.6177	23 41 11.8	10.293	20	17 34 29.90	2.6976	28 15 57.1	0.92
21	15 27 59.73	2.6228	23 51 24.2	10.121	21	17 37 11.68	2.6948	28 16 46.6	0.72
22	15 30 37.25	2.6278	24 1 26.3	9.947	22	17 39 53.28	2.6918	28 17 24.0	0.52
23	15 33 15.07	2.6328	S. 24 11 17.8	9.770	23	17 42 34.70	2.6888	S. 28 17 49.5	0.32
	SUNDAY 10.					TUESDAY 12.			
0	15 35 53.18	2.6377	S. 24 20 58.7	9.593	0	17 45 15.93	2.6854	S. 28 18 3.2	−0.12
1	15 38 31.59	2.6424	24 30 28.9	9.413	1	17 47 56.95	2.6818	28 18 5.0	+0.06
2	15 41 10.27	2.6470	24 39 48.3	9.233	2	17 50 37.75	2.6781	28 17 55.0	0.26
3	15 43 49.23	2.6515	24 48 56.8	9.051	3	17 53 18.32	2.6743	28 17 33.2	0.46
4	15 46 28.45	2.6558	24 57 54.4	8.868	4	17 55 58.66	2.6703	28 16 59.7	0.65
5	15 49 7.93	2.6602	25 6 41.0	8.683	5	17 58 38.75	2.6660	28 16 14.6	0.84
6	15 51 47.67	2.6643	25 15 16.4	8.498	6	18 1 18.58	2.6616	28 15 17.9	1.04
7	15 54 27.65	2.6683	25 23 40.7	8.311	7	18 3 58.14	2.6570	28 14 9.7	1.23
8	15 57 7.86	2.6722	25 31 53.7	8.123	8	18 6 37.42	2.6523	28 12 50.0	1.42
9	15 59 48.31	2.6759	25 39 55.4	7.933	9	18 9 16.42	2.6475	28 11 18.9	1.61
10	16 2 28.97	2.6794	25 47 45.6	7.742	10	18 11 55.12	2.6424	28 9 36.4	1.80
11	16 5 9.84	2.6829	25 55 24.4	7.550	11	18 14 33.51	2.6373	28 7 42.6	1.98
12	16 7 50.92	2.6862	26 2 51.6	7.357	12	18 17 11.59	2.6319	28 5 37.7	2.17
13	16 10 32.19	2.6893	26 10 7.2	7.163	13	18 19 49.34	2.6263	28 3 21.6	2.36
14	16 13 13.64	2.6923	26 17 11.2	6.968	14	18 22 26.75	2.6207	28 0 54.4	2.544
15	16 15 55.26	2.6951	26 24 3.4	6.773	15	18 25 3.82	2.6149	27 58 16.3	2.727
16	16 18 37.05	2.6977	26 30 43.9	6.577	16	18 27 40.54	2.6090	27 55 27.2	2.908
17	16 21 18.98	2.7001	26 37 12.6	6.379	17	18 30 16.90	2.6029	27 52 27.3	3.088
18	16 24 1.06	2.7025	26 43 29.4	6.181	18	18 32 52.89	2.5968	27 49 16.7	3.266
19	16 26 43.28	2.7047	26 49 34.3	5.982	19	18 35 28.51	2.5905	27 45 55.4	3.443
20	16 29 25.62	2.7066	26 55 27.2	5.783	20	18 38 3.75	2.5840	27 42 23.5	3.619
21	16 32 8.07	2.7083	27 1 8.2	5.583	21	18 40 38.59	2.5774	27 38 41.1	3.793
22	16 34 50.62	2.7100	27 6 37.1	5.382	22	18 43 13.04	2.5708	27 34 48.3	3.967
23	16 37 33.27	2.7115	27 11 54.0	5.181	23	18 45 47.08	2.5639	27 30 45.1	4.138
24	16 40 16.00	2.7128	S. 27 16 58.8	4.979	24	18 48 20.71	2.5570	S. 27 26 31.7	4.308

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 13.					FRIDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 48 20.71	2.5570	S. 27 26 31.7	4.308	0	20 41 55.63	2.1685	S. 21 15 3.5	10.532
1	18 50 53.92	2.5499	27 22 8.1	4.477	1	20 44 5.50	2.1606	21 4 28.9	10.621
2	18 53 26.70	2.5428	27 17 34.5	4.643	2	20 46 14.90	2.1528	20 53 49.0	10.709
3	18 55 59.05	2.5356	27 12 50.9	4.809	3	20 48 23.83	2.1448	20 43 3.8	10.796
4	18 58 30.97	2.5283	27 7 57.4	4.973	4	20 50 32.28	2.1370	20 32 13.5	10.881
5	19 1 2.44	2.5208	27 2 54.2	5.134	5	20 52 40.27	2.1293	20 21 18.1	10.965
6	19 3 33.47	2.5133	26 57 41.3	5.295	6	20 54 47.80	2.1217	20 10 17.7	11.048
7	19 6 4.04	2.5057	26 52 18.8	5.453	7	20 56 54.87	2.1141	19 59 12.4	11.128
8	19 8 34.15	2.4980	26 46 46.9	5.610	8	20 59 1.49	2.1065	19 48 2.3	11.208
9	19 11 3.80	2.4903	26 41 5.6	5.767	9	21 1 7.65	2.0990	19 36 47.4	11.287
10	19 13 32.99	2.4826	26 35 14.9	5.921	10	21 3 13.37	2.0916	19 25 27.9	11.363
11	19 16 1.71	2.4747	26 29 15.1	6.073	11	21 5 18.64	2.0842	19 14 3.9	11.438
12	19 18 29.95	2.4667	26 23 6.2	6.223	12	21 7 23.47	2.0769	19 2 35.3	11.513
13	19 20 57.71	2.4587	26 16 48.3	6.373	13	21 9 27.87	2.0697	18 51 2.3	11.586
14	19 23 24.99	2.4507	26 10 21.5	6.520	14	21 11 31.83	2.0624	18 39 25.0	11.657
15	19 25 51.79	2.4426	26 3 45.9	6.666	15	21 13 35.36	2.0553	18 27 43.5	11.727
16	19 28 18.10	2.4343	25 57 1.6	6.810	16	21 15 38.47	2.0483	18 15 57.8	11.796
17	19 30 43.91	2.4262	25 50 8.7	6.952	17	21 17 41.15	2.0413	18 4 8.0	11.863
18	19 33 9.24	2.4180	25 43 7.4	7.093	18	21 19 43.42	2.0344	17 52 14.2	11.929
19	19 35 34.07	2.4097	25 35 57.6	7.232	19	21 21 45.28	2.0276	17 40 16.5	11.994
20	19 37 58.40	2.4014	25 28 39.6	7.368	20	21 23 46.73	2.0208	17 28 14.9	12.058
21	19 40 22.24	2.3931	25 21 13.4	7.504	21	21 25 47.77	2.0140	17 16 9.5	12.121
22	19 42 45.57	2.3847	25 13 39.1	7.638	22	21 27 48.41	2.0074	17 4 0.4	12.182
23	19 45 8.40	2.3763	S. 25 5 56.8	7.770	23	21 29 48.66	2.0009	S. 16 51 47.7	12.242
	THURSDAY 14.					SATURDAY 16.			
0	19 47 30.73	2.3679	S. 24 58 6.7	7.900	0	21 31 48.52	1.9945	S. 16 39 31.4	12.301
1	19 49 52.55	2.3595	24 50 8.8	8.029	1	21 33 48.00	1.9881	16 27 11.6	12.358
2	19 52 13 87	2.3511	24 42 3.2	8.156	2	21 35 47.09	1.9818	16 14 48.4	12.414
3	19 54 34.68	2.3426	24 33 50.1	8.280	3	21 37 45.81	1.9755	16 2 21.9	12.469
4	19 56 54.98	2.3342	24 25 29.6	8.404	4	21 39 44.15	1.9693	15 49 52.1	12.524
5	19 59 14.78	2.3258	24 17 1.6	8.527	5	21 41 42.12	1.9632	15 37 19.0	12.578
6	20 1 34.08	2.3174	24 8 26.4	8.647	6	21 43 39.73	1.9573	15 24 42.8	12.629
7	20 3 52.87	2.3089	23 59 44.0	8.765	7	21 45 36.99	1.9513	15 12 3.5	12.679
8	20 6 11.15	2.3004	23 50 54.6	8.882	8	21 47 33.89	1.9454	14 59 21.3	12.728
9	20 8 28.92	2.2920	23 41 58.2	8.998	9	21 49 30.44	1.9397	14 46 36.1	12.778
10	20 10 46.19	2.2836	23 32 54.9	9.111	10	21 51 26.65	1.9340	14 33 48.0	12.825
11	20 13 2.95	2.2752	23 23 44.9	9.223	11	21 53 22.52	1.9283	14 20 57.1	12.872
12	20 15 19.21	2.2668	23 14 28.2	9.333	12	21 55 18.05	1.9228	14 8 3.4	12.917
13	20 17 34.96	2.2584	23 5 4.9	9.442	13	21 57 13.25	1.9173	13 55 7.1	12.961
14	20 19 50.22	2.2502	22 55 35.2	9.548	14	21 59 8.13	1.9120	13 42 8.1	13.004
15	20 22 4.98	2.2418	22 45 59.1	9.653	15	22 1 2.69	1.9068	13 29 6.6	13.047
16	20 24 19.24	2.2335	22 36 16.8	9.757	16	22 2 56.94	1.9016	13 16 2.5	13.088
17	20 26 33.00	2.2253	22 26 28.3	9.859	17	22 4 50.88	1.8964	13 2 56.0	13.128
18	20 28 46.27	2.2171	22 16 33.7	9.960	18	22 6 44.51	1.8913	12 49 47.1	13.168
19	20 30 59.05	2.2088	22 6 33.1	10.059	19	22 8 37.84	1.8863	12 36 35.9	13.206
20	20 33 11.33	2.2007	21 56 26.6	10.157	20	22 10 30.87	1.8815	12 23 22.4	13.243
21	20 35 23.13	2.1927	21 46 14.3	10.253	21	22 12 23.62	1.8768	12 10 6.7	13.280
22	20 37 34.45	2.1846	21 35 56.3	10.347	22	22 14 16.08	1.8720	11 56 48.8	13.315
23	20 39 45.28	2.1765	21 25 32.7	10.440	23	22 16 8.26	1.8673	11 43 28.9	13.349
24	20 41 55.63	2.1685	S. 21 15 3.5	10.532	24	22 18 0.16	1.8628	S. 11 30 6.9	13.383

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 17.

Hour.	Right Ascension.	Diff. for 1 Min.		Declination.	Diff. for 1 Min.
	h m s	s		° ′ ″	″
0	22 18 0.16	1.8628	S.	11 30 6.9	13.383
1	22 19 51.79	1.8583		11 16 42.9	13.416
2	22 21 43.16	1.8540		11 3 17.0	13.448
3	22 23 34.27	1.8497		10 49 49.2	13.478
4	22 25 25.12	1.8455		10 36 19.6	13.508
5	22 27 15.73	1.8414		10 22 48.2	13.538
6	22 29 6.09	1.8373		10 9 15.0	13.567
7	22 30 56.20	1.8333		9 55 40.2	13.593
8	22 32 46.08	1.8294		9 42 3.8	13.620
9	22 34 35.73	1.8257		9 28 25.8	13.647
10	22 36 25.16	1.8219		9 14 46.2	13.672
11	22 38 14.36	1.8183		9 1 5.2	13.695
12	22 40 3.35	1.8148		8 47 22.8	13.718
13	22 41 52.13	1.8113		8 33 39.0	13.741
14	22 43 40.70	1.8078		8 19 53.9	13.763
15	22 45 29.07	1.8046		8 6 7.5	13.783
16	22 47 17.25	1.8014		7 52 19.9	13.803
17	22 49 5.24	1.7983		7 38 31.1	13.823
18	22 50 53.04	1.7952		7 24 41.2	13.841
19	22 52 40.66	1.7922		7 10 50.2	13.859
20	22 54 28.10	1.7893		6 56 58.1	13.876
21	22 56 15.38	1.7866		6 43 5.1	13.892
22	22 58 2.49	1.7838		6 29 11.1	13.908
23	22 59 49.43	1.7811	S.	6 15 16.2	13.923

MONDAY 18.

Hour.	Right Ascension.	Diff. for 1 Min.		Declination.	Diff. for 1 Min.
0	23 1 36.22	1.7786	S.	6 1 20.4	13.937
1	23 3 22.86	1.7761		5 47 23.8	13.949
2	23 5 9.35	1.7737		5 33 26.5	13.962
3	23 6 55.70	1.7713		5 19 28.4	13.974
4	23 8 41.91	1.7691		5 5 29.6	13.985
5	23 10 27.99	1.7670		4 51 30.2	13.995
6	23 12 13.95	1.7649		4 37 30.2	14.004
7	23 13 59.78	1.7628		4 23 29.7	14.013
8	23 15 45.49	1.7609		4 9 28.6	14.022
9	23 17 31.09	1.7592		3 55 27.1	14.029
10	23 19 16.59	1.7574		3 41 25.1	14.037
11	23 21 1.98	1.7557		3 27 22.7	14.043
12	23 22 47.27	1.7541		3 13 20.0	14.048
13	23 24 32.47	1.7526		2 59 17.0	14.053
14	23 26 17.58	1.7511		2 45 13.7	14.057
15	23 28 2.60	1.7498		2 31 10.2	14.059
16	23 29 47.55	1.7485		2 17 6.6	14.062
17	23 31 32.42	1.7473		2 3 2.8	14.064
18	23 33 17.22	1.7462		1 48 58.9	14.066
19	23 35 1.96	1.7451		1 34 54.9	14.067
20	23 36 46.63	1.7441		1 20 50.9	14.067
21	23 38 31.25	1.7433		1 6 46.9	14.066
22	23 40 15.82	1.7424		0 52 43.0	14.064
23	23 42 0.34	1.7417		0 38 39.2	14.063
24	23 43 44.82	1.7410	S.	0 24 35.5	14.060

TUESDAY 19.

Hour.	Right Ascension.	Diff. for 1 Min.		Declination.	Diff. for 1 Min.
	h m s	s		° ′ ″	″
0	23 43 44.82	1.7410	S.	0 24 35.5	14.060
1	23 45 29.26	1.7404	S.	0 10 32.0	14.057
2	23 47 13.67	1.7399	N.	0 3 31.3	14.053
3	23 48 58.05	1.7395		0 17 34.3	14.048
4	23 50 42.41	1.7392		0 31 37.0	14.043
5	23 52 26.75	1.7389		0 45 39.4	14.037
6	23 54 11.08	1.7388		0 59 41.4	14.030
7	23 55 55.40	1.7386		1 13 43.0	14.023
8	23 57 39.71	1.7385		1 27 44.2	14.015
9	23 59 24.02	1.7386		1 41 44.8	14.006
10	0 1 8.34	1.7387		1 55 44.9	13.998
11	0 2 52.66	1.7388		2 9 44.5	13.988
12	0 4 37.00	1.7391		2 23 43.4	13.977
13	0 6 21.35	1.7394		2 37 41.7	13.965
14	0 8 5.73	1.7398		2 51 39.2	13.953
15	0 9 50.13	1.7403		3 5 36.0	13.940
16	0 11 34.57	1.7409		3 19 32.0	13.927
17	0 13 19.04	1.7415		3 33 27.2	13.913
18	0 15 3.55	1.7422		3 47 21.5	13.898
19	0 16 48.10	1.7429		4 1 15.0	13.883
20	0 18 32.70	1.7438		4 15 7.5	13.867
21	0 20 17.36	1.7448		4 28 59.0	13.850
22	0 22 2.07	1.7457		4 42 49.5	13.833
23	0 23 46.84	1.7468	N.	4 56 39.0	13.815

WEDNESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Min.		Declination.	Diff. for 1 Min.
0	0 25 31.68	1.7479	N.	5 10 27.3	13.796
1	0 27 16.59	1.7492		5 24 14.5	13.777
2	0 29 1.58	1.7504		5 38 0.5	13.757
3	0 30 46.64	1.7518		5 51 45.3	13.736
4	0 32 31.79	1.7533		6 5 28.8	13.715
5	0 34 17.03	1.7548		6 19 11.1	13.693
6	0 36 2.36	1.7563		6 32 52.0	13.670
7	0 37 47.78	1.7578		6 46 31.5	13.646
8	0 39 33.30	1.7596		7 0 9.5	13.622
9	0 41 18.93	1.7614		7 13 46.1	13.598
10	0 43 4.67	1.7633		7 27 21.2	13.572
11	0 44 50.52	1.7651		7 40 54.7	13.545
12	0 46 36.48	1.7671		7 54 26.6	13.518
13	0 48 22.57	1.7693		8 7 56.8	13.490
14	0 50 8.79	1.7713		8 21 25.4	13.462
15	0 51 55.13	1.7735		8 34 52.2	13.432
16	0 53 41.61	1.7758		8 48 17.2	13.402
17	0 55 28.22	1.7781		9 1 40.4	13.372
18	0 57 14.98	1.7805		9 15 1.8	13.340
19	0 59 1.88	1.7830		9 28 21.2	13.308
20	1 0 48.94	1.7856		9 41 38.7	13.274
21	1 2 36.15	1.7882		9 54 54.1	13.240
22	1 4 23.52	1.7908		10 8 7.5	13.206
23	1 6 11.04	1.7935		10 21 18.8	13.171
24	1 7 58.74	1.7963	N.	10 34 28.0	13.135

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 21.			
	h m s	s	° ′ ″	″
0	1 7 58.74	1.7963	N. 10 34 28.0	13.135
1	1 9 46.60	1.7992	10 47 35.0	13.098
2	1 11 34.64	1.8022	11 0 39.7	13.060
3	1 13 22.86	1.8052	11 13 42.2	13.022
4	1 15 11.26	1.8082	11 26 42.3	12.982
5	1 16 59.84	1.8113	11 39 40.0	12.943
6	1 18 48.61	1.8145	11 52 35.4	12.903
7	1 20 37.58	1.8178	12 5 28.3	12.860
8	1 22 26.74	1.8211	12 18 18.6	12.818
9	1 24 16.11	1.8245	12 31 6.4	12.774
10	1 26 5.68	1.8279	12 43 51.5	12.730
11	1 27 55.46	1.8314	12 56 34.0	12.685
12	1 29 45.45	1.8349	13 9 13.7	12.638
13	1 31 35.65	1.8386	13 21 50.6	12.592
14	1 33 26.08	1.8423	13 34 24.7	12.545
15	1 35 16.73	1.8460	13 46 56.0	12.497
16	1 37 7.60	1.8498	13 59 24.4	12.448
17	1 38 58.70	1.8537	14 11 49.8	12.398
18	1 40 50.04	1.8577	14 24 12.1	12.347
19	1 42 41.62	1.8616	14 36 31.4	12.295
20	1 44 33.43	1.8656	14 48 47.5	12.242
21	1 46 25.49	1.8697	15 1 0.4	12.188
22	1 48 17.79	1.8738	15 13 10.1	12.134
23	1 50 10.35	1.8781	N. 15 25 16.5	12.078
	FRIDAY 22.			
0	1 52 3.16	1.8823	N. 15 37 19.5	12.022
1	1 53 56.23	1.8866	15 49 19.1	11.965
2	1 55 49.55	1.8908	16 1 15.3	11.908
3	1 57 43.13	1.8953	16 13 8.0	11.848
4	1 59 36.98	1.8999	16 24 57.1	11.788
5	2 1 31.11	1.9044	16 36 42.5	11.727
6	2 3 25.50	1.9088	16 48 24.3	11.665
7	2 5 20.17	1.9134	17 0 2.3	11.602
8	2 7 15.11	1.9181	17 11 36.5	11.538
9	2 9 10.34	1.9228	17 23 6.9	11.474
10	2 11 5.85	1.9275	17 34 33.4	11.408
11	2 13 1.64	1.9323	17 45 55.9	11.341
12	2 14 57.73	1.9372	17 57 14.3	11.273
13	2 16 54.10	1.9420	18 8 28.7	11.205
14	2 18 50.77	1.9470	18 19 38.9	11.135
15	2 20 47.74	1.9519	18 30 44.9	11.064
16	2 22 45.00	1.9569	18 41 46.6	10.993
17	2 24 42.57	1.9620	18 52 44.0	10.920
18	2 26 40.44	1.9670	19 3 37.0	10.847
19	2 28 38.61	1.9721	19 14 25.6	10.773
20	2 30 37.09	1.9773	19 25 9.7	10.697
21	2 32 35.89	1.9826	19 35 49.2	10.619
22	2 34 35.00	1.9878	19 46 24.0	10.542
23	2 36 34.42	1.9929	19 56 54.2	10.463
24	2 38 34.15	1.9982	N. 20 7 19.6	10.383

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 23.			
	h m s	s	° ′ ″	″
0	2 38 34.15	1.9982	N. 20 7 19.6	10.383
1	2 40 34.20	2.0035	20 17 40.2	10.303
2	2 42 34.57	2.0089	20 27 55.9	10.220
3	2 44 35.27	2.0143	20 38 6.6	10.138
4	2 46 36.29	2.0197	20 48 12.4	10.054
5	2 48 37.63	2.0251	20 58 13.1	9.968
6	2 50 39.30	2.0305	21 8 8.6	9.882
7	2 52 41.29	2.0359	21 17 58.9	9.795
8	2 54 43.61	2.0414	21 27 44.0	9.708
9	2 56 46.26	2.0470	21 37 23.8	9.618
10	2 58 49.25	2.0525	21 46 58.1	9.527
11	3 0 52.56	2.0580	21 56 27.0	9.436
12	3 2 56.21	2.0636	22 5 50.4	9.343
13	3 5 0.19	2.0691	22 15 8.2	9.249
14	3 7 4.50	2.0747	22 24 20.3	9.155
15	3 9 9.15	2.0803	22 33 26.8	9.060
16	3 11 14.13	2.0858	22 42 27.5	8.963
17	3 13 19.45	2.0915	22 51 22.3	8.864
18	3 15 25.11	2.0971	23 0 11.2	8.765
19	3 17 31.10	2.1027	23 8 54.1	8.665
20	3 19 37.43	2.1083	23 17 31.0	8.564
21	3 21 44.09	2.1138	23 26 1.8	8.462
22	3 23 51.09	2.1195	23 34 26.5	8.359
23	3 25 58.43	2.1251	N. 23 42 44.9	8.254
	SUNDAY 24.			
0	3 28 6.10	2.1306	N. 23 50 57.0	8.148
1	3 30 14.10	2.1362	23 59 2.7	8.042
2	3 32 22.44	2.1418	24 7 2.0	7.934
3	3 34 31.11	2.1473	24 14 54.8	7.826
4	3 36 40.11	2.1528	24 22 41.1	7.716
5	3 38 49.45	2.1583	24 30 20.7	7.604
6	3 40 59.11	2.1638	24 37 53.6	7.493
7	3 43 9.10	2.1693	24 45 19.8	7.380
8	3 45 19.43	2.1748	24 52 39.2	7.266
9	3 47 30.08	2.1802	24 59 51.7	7.151
10	3 49 41.05	2.1856	25 6 57.3	7.034
11	3 51 52.35	2.1910	25 13 55.8	6.917
12	3 54 3.97	2.1963	25 20 47.3	6.798
13	3 56 15.91	2.2017	25 27 31.6	6.679
14	3 58 28.17	2.2069	25 34 8.8	6.559
15	4 0 40.74	2.2121	25 40 38.7	6.438
16	4 2 53.62	2.2173	25 47 1.3	6.315
17	4 5 6.82	2.2226	25 53 16.5	6.191
18	4 7 20.33	2.2277	25 59 24.2	6.067
19	4 9 34.14	2.2327	26 5 24.5	5.942
20	4 11 48.25	2.2378	26 11 17.2	5.815
21	4 14 2.67	2.2428	26 17 2.3	5.688
22	4 16 17.38	2.2477	26 22 39.8	5.560
23	4 18 32.39	2.2525	26 28 9.5	5.430
24	4 20 47.68	2.2573	N. 26 33 31.4	5.300

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 25.					WEDNESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 20 47.68	2.2573	N. 26 33 31.4	5.300	0	6 13 11.54	2.3888	N. 28 3 12.1	1.774
1	4 23 3.26	2.2621	26 38 45.5	5.168	1	6 15 34.87	2.3889	28 1 20.9	1.931
2	4 25 19.13	2.2668	26 43 51.6	5.036	2	6 17 58.21	2.3891	27 59 20.4	2.087
3	4 27 35.28	2.2714	26 48 49.8	4.903	3	6 20 21.56	2.3891	27 57 10.5	2.243
4	4 29 51.70	2.2760	26 53 40.0	4.770	4	6 22 44.90	2.3888	27 54 51.2	2.400
5	4 32 8.40	2.2805	26 58 22.2	4.635	5	6 25 8.22	2.3886	27 52 22.5	2.557
6	4 34 25.36	2.2849	27 2 56.2	4.499	6	6 27 31.53	2.3883	27 49 44.4	2.713
7	4 36 42.59	2.2893	27 7 22.1	4.363	7	6 29 54.81	2.3878	27 46 56.9	2.869
8	4 39 0.08	2.2936	27 11 39.7	4.225	8	6 32 18.07	2.3873	27 44 0.1	3.025
9	4 41 17.82	2.2978	27 15 49.1	4.087	9	6 34 41.29	2.3866	27 40 53.9	3.182
10	4 43 35.82	2.3020	27 19 50.1	3.948	10	6 37 4.46	2.3858	27 37 38.3	3.338
11	4 45 54.06	2.3060	27 23 42.8	3.808	11	6 39 27.58	2.3849	27 34 13.4	3.493
12	4 48 12.54	2.3100	27 27 27.0	3.667	12	6 41 50.65	2.3839	27 30 39.2	3.648
13	4 50 31.26	2.3139	27 31 2.8	3.525	13	6 44 13.65	2.3828	27 26 55.6	3.803
14	4 52 50.21	2.3178	27 34 30.0	3.383	14	6 46 36.59	2.3817	27 23 2.8	3.958
15	4 55 9.39	2.3215	27 37 48.7	3.240	15	6 48 59.45	2.3805	27 19 0.7	4.113
16	4 57 28.79	2.3251	27 40 58.8	3.096	16	6 51 22.24	2.3791	27 14 49.3	4.267
17	4 59 48.40	2.3287	27 44 0.2	2.952	17	6 53 44.94	2.3775	27 10 28.7	4.421
18	5 2 8.23	2.3322	27 46 53.0	2.807	18	6 56 7.54	2.3759	27 5 58.8	4.574
19	5 4 28.26	2.3356	27 49 37.0	2.661	19	6 58 30.05	2.3743	27 1 19.8	4.727
20	5 6 48.50	2.3389	27 52 12.3	2.514	20	7 0 52.46	2.3726	26 56 31.6	4.880
21	5 9 8.93	2.3420	27 54 38.7	2.367	21	7 3 14.76	2.3708	26 51 34.2	5.033
22	5 11 29.54	2.3451	27 56 56.3	2.219	22	7 5 36.95	2.3688	26 46 27.7	5.184
23	5 13 50.34	2.3481	N. 27 59 5.0	2.070	23	7 7 59.02	2.3668	N. 26 41 12.1	5.335
	TUESDAY 26.					THURSDAY 28.			
0	5 16 11.31	2.3510	N. 28 1 4.7	1.921	0	7 10 20.96	2.3647	N. 26 35 47.5	5.486
1	5 18 32.46	2.3538	28 2 55.5	1.772	1	7 12 42.78	2.3625	26 30 13.8	5.637
2	5 20 53.77	2.3565	28 4 37.3	1.622	2	7 15 4.46	2.3602	26 24 31.1	5.787
3	5 23 15.24	2.3591	28 6 10.1	1.472	3	7 17 26.00	2.3578	26 18 39.4	5.936
4	5 25 36.86	2.3616	28 7 33.9	1.321	4	7 19 47.40	2.3554	26 12 38.8	6.084
5	5 27 58.63	2.3640	28 8 48.6	1.168	5	7 22 8.65	2.3530	26 6 29.3	6.233
6	5 30 20.54	2.3663	28 9 54.1	1.016	6	7 24 29.76	2.3504	26 0 10.9	6.381
7	5 32 42.59	2.3685	28 10 50.5	0.864	7	7 26 50.70	2.3478	25 53 43.6	6.528
8	5 35 4.76	2.3706	28 11 37.8	0.712	8	7 29 11.49	2.3451	25 47 7.5	6 674
9	5 37 27.06	2.3726	28 12 15.9	0.558	9	7 31 32.11	2.3423	25 40 22.7	6.819
10	5 39 49.47	2.3744	28 12 44.8	0.404	10	7 33 52.57	2.3395	25 33 29.2	6.964
11	5 42 11.99	2.3762	28 13 4.4	0.250	11	7 36 12.85	2.3366	25 26 27.0	7.109
12	5 44 34.61	2.3778	28 13 14.8	+0.096	12	7 38 32.96	2.3337	25 19 16.1	7.253
13	5 46 57.33	2.3793	28 13 15.9	−0.059	13	7 40 52.89	2.3306	25 11 56.6	7.396
14	5 49 20.13	2.3808	28 13 7.7	0.214	14	7 43 12.63	2.3275	25 4 28.6	7.538
15	5 51 43.02	2.3820	28 12 50.2	0.369	15	7 45 32.19	2.3244	24 56 52.1	7.679
16	5 54 5.97	2.3832	28 12 23.4	0.524	16	7 47 51.56	2.3212	24 49 7.1	7.820
17	5 56 29.00	2.3843	28 11 47.3	0.680	17	7 50 10.73	2.3179	24 41 13.7	7.960
18	5 58 52.09	2.3853	28 11 1.8	0.836	18	7 52 29.71	2.3147	24 33 11.9	8.099
19	6 1 15.23	2.3861	28 10 7.0	0.992	19	7 54 48.49	2.3114	24 25 1.8	8.238
20	6 3 38.42	2.3869	28 9 2.8	1.148	20	7 57 7.08	2.3081	24 16 43.4	8.375
21	6 6 1.66	2.3876	28 7 49.2	1.305	21	7 59 25.46	2.3046	24 8 16.8	8.512
22	6 8 24.93	2.3880	28 6 26.2	1.462	22	8 1 43.63	2.3012	23 59 42.0	8.647
23	6 10 48.22	2.3884	28 4 53.8	1.618	23	8 4 1.60	2.2977	23 50 59.2	8.782
24	6 13 11.54	2.3888	N. 28 3 12.1	1.774	24	8 6 19.35	2.2941	N. 23 42 8.2	8.917

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 29.			
	h m s	s	° ′ ″	″
0	8 6 19.35	2.2941	N. 23 42 8.2	8.917
1	8 8 36.89	2.2906	23 33 9.2	9.049
2	8 10 54.22	2.2870	23 24 2.3	9.182
3	8 13 11.33	2.2834	23 14 47.4	9.313
4	8 15 28.23	2.2798	23 5 24.7	9.443
5	8 17 44.91	2.2761	22 55 54.2	9.573
6	8 20 1.36	2.2724	22 46 15.9	9.703
7	8 22 17.60	2.2688	22 36 29.9	9.830
8	8 24 33.62	2.2652	22 26 36.3	9.957
9	8 26 49.42	2.2614	22 16 35.1	10.083
10	8 29 4.99	2.2577	22 6 26.4	10.207
11	8 31 20.34	2.2539	21 56 10.3	10.331
12	8 33 35.46	2.2502	21 45 46.7	10.454
13	8 35 50.36	2.2464	21 35 15.8	10.576
14	8 38 5.03	2.2428	21 24 37.6	10.697
15	8 40 19.49	2.2390	21 13 52.2	10.817
16	8 42 33.71	2.2352	21 2 59.6	10.935
17	8 44 47.71	2.2315	20 52 0.0	11.053
18	8 47 1.49	2.2278	20 40 53.3	11.170
19	8 49 15.04	2.2240	20 29 39.6	11.285
20	8 51 28.37	2.2203	20 18 19.1	11.399
21	8 53 41.47	2.2165	20 6 51.7	11.514
22	8 55 54.35	2.2128	19 55 17.4	11.627
23	8 58 7.01	2.2092	N. 19 43 36.5	11.738
	SATURDAY 30.			
0	9 0 19.45	2.2055	N. 19 31 48.9	11.848
1	9 2 31.67	2.2018	19 19 54.7	11.958
2	9 4 43.67	2.1983	19 7 54.0	12.065
3	9 6 55.46	2.1947	18 55 46.9	12.172
4	9 9 7.03	2.1910	18 43 33.4	12.278
5	9 11 18.38	2.1875	18 31 13.5	12.384
6	9 13 29.53	2.1840	18 18 47.3	12.488
7	9 15 40.46	2.1805	18 6 15.0	12.590
8	9 17 51.19	2.1771	17 53 36.5	12.692
9	9 20 1.71	2.1736	17 40 52.0	12.793
10	9 22 12.02	2.1702	17 28 1.4	12.893
11	9 24 22.13	2.1668	17 15 4.9	12.990
12	9 26 32.04	2.1635	17 2 2.6	13.087
13	9 28 41.75	2.1603	16 48 54.5	13.183
14	9 30 51.27	2.1571	16 35 40.6	13.278
15	9 33 0.60	2.1539	16 22 21.1	13.372
16	9 35 9.74	2.1507	16 8 56.0	13.464
17	9 37 18.68	2.1476	15 55 25.4	13.556
18	9 39 27.45	2.1446	15 41 49.3	13.647
19	9 41 36.03	2.1416	15 28 7.8	13.736
20	9 43 44.44	2.1387	15 14 21.0	13.823
21	9 45 52.67	2.1357	15 0 29.0	13.910
22	9 48 0.72	2.1328	14 46 31.8	13.996
23	9 50 8.61	2.1301	14 32 29.5	14.080
24	9 52 16.33	2.1273	N. 14 18 22.2	14.163

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 31.			
	h m s	s	° ′ ″	″
0	9 52 16.33	2.1273	N. 14 18 22.2	14.163
1	9 54 23.89	2.1247	14 4 9.9	14.246
2	9 56 31.29	2.1220	13 49 52.7	14.327
3	9 58 38.53	2.1194	13 35 30.7	14.407
4	10 0 45.62	2.1169	13 21 3.9	14.485
5	10 2 52.56	2.1145	13 6 32.5	14.563
6	10 4 59.36	2.1122	12 51 56.4	14.639
7	10 7 6.02	2.1098	12 37 15.8	14.713
8	10 9 12.54	2.1076	12 22 30.8	14.788
9	10 11 18.93	2.1053	12 7 41.3	14.861
10	10 13 25.18	2.1032	11 52 47.5	14.933
11	10 15 31.31	2.1013	11 37 49.4	15.003
12	10 17 37.33	2.0993	11 22 47.2	15.072
13	10 19 43.23	2.0973	11 7 40.8	15.139
14	10 21 49.01	2.0955	10 52 30.5	15.206
15	10 23 54.69	2.0938	10 37 16.1	15.272
16	10 26 0.26	2.0920	10 21 57.9	15.335
17	10 28 5.73	2.0904	10 6 35.9	15.398
18	10 30 11.11	2.0889	9 51 10.1	15.461
19	10 32 16.40	2.0874	9 35 40.6	15.522
20	10 34 21.60	2.0860	9 20 7.5	15.581
21	10 36 26.72	2.0847	9 4 30.9	15.638
22	10 38 31.76	2.0834	8 48 50.9	15.695
23	10 40 36.73	2.0823	N. 8 33 7.5	15.751
	MONDAY, JUNE 1.			
0	10 42 41.64	2.0813	N. 8 17 20.8	15.805

PHASES OF THE MOON.

			d	h	m
☽	First Quarter	May	2	18	29.0
○	Full Moon		9	9	30.8
☾	Last Quarter		16	10	12.1
●	New Moon		24	14	34.8

			d	h
☾	Perigee	May	8	7.7
☾	Apogee		20	16.2

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semidiameter.	Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	4 34 0.27	10.221	N.21 58 52.9	+20.95	15 48.01	68.34	2 29.44	0.364
Tues.	2	4 38 5.79	10.238	22 7 4.4	20.00	15 47.88	68.40	2 20.50	0.380
Wed.	3	4 42 11.69	10.253	22 14 52.7	19.03	15 47.75	68.46	2 11.18	0.395
Thur.	4	4 46 17.94	10.268	22 22 17.7	+18.05	15 47.62	68.51	2 1.51	0.410
Frid.	5	4 50 24.54	10.282	22 29 19.3	17.07	15 47.50	68.56	1 51.50	0.424
Sat.	6	4 54 31.46	10.295	22 35 57.3	16.09	15 47.38	68.61	1 41.16	0.437
SUN.	7	4 58 38.70	10.308	22 42 11.6	+15.10	15 47.27	68.65	1 30.51	0.450
Mon.	8	5 2 46.24	10.320	22 48 2.0	14.10	15 47.16	68.69	1 19.56	0.462
Tues.	9	5 6 54.06	10.331	22 53 28.5	13.10	15 47.05	68.73	1 8.32	0.474
Wed.	10	5 11 2.16	10.342	22 58 30.9	+12.10	15 46.94	68.76	0 56.82	0.485
Thur.	11	5 15 10.51	10.352	23 3 9.2	11.09	15 46.83	68.79	0 45.06	0.495
Frid.	12	5 19 19.09	10.361	23 7 23.2	10.08	15 46.73	68.82	0 33.06	0.504
Sat.	13	5 23 27.90	10.370	23 11 12.8	+ 9.06	15 46.63	68.85	0 20.85	0.513
SUN.	14	5 27 36.90	10.379	23 14 37.9	8.04	15 46.54	68.87	0 8.45	0.520
Mon.	15	5 31 46.07	10.386	23 17 38.5	7.01	15 46.45	68.89	0 4.13	0.527
Tues.	16	5 35 55.39	10.391	23 20 14.4	+ 5.98	15 46.36	68.91	0 16.86	0.533
Wed.	17	5 40 4.84	10.396	23 22 25.6	4.95	15 46.28	68.93	0 29.71	0.538
Thur.	18	5 44 14.39	10.400	23 24 12.0	3.92	15 46.21	68.94	0 42.67	0.542
Frid.	19	5 48 24.03	10.403	23 25 33.7	+ 2.89	15 46.14	68.95	0 55.71	0.544
Sat.	20	5 52 33.71	10.404	23 26 30.5	1.85	15 46.07	68.95	1 8.80	0.545
SUN.	21	5 56 43.42	10.405	23 27 2.5	+ 0.82	15 46.01	68.95	1 21.91	0.546
Mon.	22	6 0 53.13	10.404	23 27 9.6	− 0.22	15 45.95	68.94	1 35.03	0.545
Tues.	23	6 5 2.81	10.402	23 26 51.9	1.26	15 45.90	68.93	1 48.12	0.544
Wed.	24	6 9 12.44	10.399	23 26 9.3	2.29	15 45.86	68.92	2 1.15	0.541
Thur.	25	6 13 21.99	10.395	23 25 2.0	− 3.32	15 45.82	68.91	2 14.10	0.537
Frid.	26	6 17 31.42	10.390	23 23 29.8	4.35	15 45.79	68.89	2 26.94	0.532
Sat.	27	6 21 40.70	10.384	23 21 32.9	5.38	15 45.76	68.87	2 39.63	0.525
SUN.	28	6 25 49.82	10.377	23 19 11.3	− 6.41	15 45.74	68.84	2 52.16	0.518
Mon.	29	6 29 58.75	10.368	23 16 25.2	7.43	15 45.72	68.81	3 4.50	0.509
Tues.	30	6 34 7.46	10.358	23 13 14.6	8.45	15 45.71	68.79	3 16.62	0.500
Wed.	31	6 38 15.93	10.348	N.23 9 39.7	− 9.46	15 45.70	68.76	3 28.50	0.489

Note.—The mean time of semidiameter passing meridian may be found by subtracting $0^{s}.19$ from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	4 34 0.69	10.221	N.21 58 53.8	+20.95	2 29.42	0.364	4 36 30.11
Tues.	2	4 38 6.19	10.237	22 7 5.2	19.99	2 20.48	0.380	4 40 26.67
Wed.	3	4 42 12.06	10.252	22 14 53.4	19.02	2 11.17	0.395	4 44 23.23
Thur.	4	4 46 18.29	10.267	22 22 18.3	+18.05	2 1.50	0.410	4 48 19.79
Frid.	5	4 50 24.86	10.281	22 29 19.8	17.07	1 51.49	0.424	4 52 16.34
Sat.	6	4 54 31.75	10.294	22 35 57.7	16.09	1 41.15	0.437	4 56 12.90
SUN.	7	4 58 38.96	10.307	22 42 11.9	+15.10	1 30.50	0.450	5 0 9.46
Mon.	8	5 2 46.47	10.319	22 48 2.3	14.10	1 19.55	0.462	5 4 6.02
Tues.	9	5 6 54.27	10.330	22 53 28.7	13.10	1 8.31	0.474	5 8 2.58
Wed.	10	5 11 2.33	10.341	22 58 31.1	+12.10	0 56.81	0.485	5 11 59.14
Thur.	11	5 15 10.64	10.351	23 3 9.3	11.09	0 45.05	0.495	5 15 55.69
Frid.	12	5 19 19.19	10.360	23 7 23.2	10.07	0 33.06	0.504	5 19 52.25
Sat.	13	5 23 27.96	10.369	23 11 12.8	+ 9.05	0 20.85	0.513	5 23 48.81
SUN.	14	5 27 36.92	10.377	23 14 37.9	8.03	0 8.45	0.520	5 27 45.37
Mon.	15	5 31 46.06	10.384	23 17 38.5	7.01	0 4.13	0.527	5 31 41.93
Tues.	16	5 35 55.35	10.389	23 20 14.4	+ 5.98	0 16.86	0.533	5 35 38.49
Wed.	17	5 40 4.76	10.394	23 22 25.6	4.95	0 29.71	0.538	5 39 35.04
Thur.	18	5 44 14.27	10.398	23 24 12.0	3.92	0 42.67	0.542	5 43 31.60
Frid.	19	5 48 23.87	10.401	23 25 33.7	+ 2.89	0 55.70	0.544	5 47 28.16
Sat.	20	5 52 33.51	10.402	23 26 30.5	1.85	1 8.79	0.545	5 51 24.72
SUN.	21	5 56 43.18	10.403	23 27 2.5	+ 0.82	1 21.90	0.546	5 55 21.28
Mon.	22	6 0 52.86	10.402	23 27 9.6	− 0.22	1 35.01	0.545	5 59 17.84
Tues.	23	6 5 2.50	10.401	23 26 51.9	1.26	1 48.10	0.544	6 3 14.40
Wed.	24	6 9 12.09	10.398	23 26 9.4	2.29	2 1.14	0.541	6 7 10.96
Thur.	25	6 13 21.60	10.394	23 25 2.1	− 3.32	2 14.09	0.537	6 11 7.51
Frid.	26	6 17 30.99	10.388	23 23 30.0	4.35	2 26.92	0.532	6 15 4.07
Sat.	27	6 21 40.24	10.382	23 21 33.1	5.38	2 39.61	0.525	6 19 0.63
SUN.	28	6 25 49.32	10.375	23 19 11.6	− 6.41	2 52.14	0.518	6 22 57.19
Mon.	29	6 29 58.22	10.366	23 16 25.6	7.43	3 4.47	0.509	6 26 53.75
Tues.	30	6 34 6.90	10.356	23 13 15.1	8.45	3 16.59	0.500	6 30 50.31
Wed.	31	6 38 15.33	10.346	N.23 9 40.2	− 9.46	3 28.47	0.489	6 34 46.87

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	Diff. for 1 Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	152	70 8 24.0	7 58.3	143.71	+0.16	0.006 1365	+25.5	19 20 19.28
2	153	71 5 52.4	5 26.4	143.65	+0.03	0.006 1967	24.8	19 16 23.37
3	154	72 3 19.4	2 53.3	143.60	−0.09	0.006 2552	24.1	19 12 27.45
4	155	73 0 45.2	0 18.9	143.55	−0.20	0.006 3122	+23.5	19 8 31.54
5	156	73 58 9.8	57 43.3	143.50	0.28	0.006 3679	22.9	19 4 35.63
6	157	74 55 33.3	55 6.6	143.46	0.34	0.006 4222	22.4	19 0 39.72
7	158	75 52 55.8	52 28.9	143.42	−0.37	0.006 4752	+21.9	18 56 43.80
8	159	76 50 17.4	49 50.3	143.38	0.37	0.006 5271	21.4	18 52 47.89
9	160	77 47 38.2	47 11.0	143.35	0.33	0.006 5778	20.8	18 48 51.98
10	161	78 44 58.3	44 30.9	143.32	−0.28	0.006 6271	+20.3	18 44 56.07
11	162	79 42 17.9	41 50.3	143.30	0.20	0.006 6751	19.7	18 41 0.16
12	163	80 39 36.9	39 9.1	143.28	−0.09	0.006 7217	19.1	18 37 4.24
13	164	81 36 55.5	36 27.5	143.27	+0.03	0.006 7666	+18.4	18 33 8.33
14	165	82 34 13.6	33 45.5	143.25	0.16	0.006 8098	17.6	18 29 12.42
15	166	83 31 31.4	31 3.1	143.23	0.28	0.006 8512	16.8	18 25 16.50
16	167	84 28 48.9	28 20.4	143.22	+0.40	0.006 8906	+16.0	18 21 20.59
17	168	85 26 6.0	25 37.3	143.21	0.51	0.006 9280	15.1	18 17 24.68
18	169	86 23 22.9	22 54.0	143.19	0.60	0.006 9632	14.2	18 13 28.77
19	170	87 20 39.5	20 10.4	143.18	+0.67	0.006 9962	+13.2	18 9 32.85
20	171	88 17 55.8	17 26.5	143.17	0.71	0.007 0268	12.2	18 5 36.94
21	172	89 15 11.8	14 42.3	143.16	0.73	0.007 0550	11.2	18 1 41.03
22	173	90 12 27.5	11 57.8	143.15	+0.71	0.007 0807	+10.2	17 57 45.12
23	174	91 9 42.9	9 13.0	143.13	0.67	0.007 1038	9.1	17 53 49.20
24	175	92 6 58.0	6 27.9	143.12	0.61	0.007 1243	8.0	17 49 53.29
25	176	93 4 12.7	3 42.4	143.10	+0.53	0.007 1422	+ 6.9	17 45 57.38
26	177	94 1 27.1	0 56.6	143.09	0.42	0.007 1576	5.8	17 42 1.46
27	178	94 58 41.0	58 10.3	143.07	0.28	0.007 1704	4.8	17 38 5.55
28	179	95 55 54.4	55 23.6	143.05	+0.14	0.007 1808	+ 3.8	17 34 9.64
29	180	96 53 7.4	52 36.4	143.03	+0.01	0.007 1888	2.8	17 30 13.73
30	181	97 50 20.0	49 48.8	143.01	−0.11	0.007 1946	1.9	17 26 17.81
31	182	98 47 32.2	47 0.8	143.00	−0.22	0.007 1983	+ 1.1	17 22 21.90

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
$-9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 1.0	16 5.8	58 41.22	+1.483	58 58.78	+1.439	6 18.3	1.97	7.4
2	16 10.4	16 14.7	59 15.64	1.367	59 31.46	1.265	7 5.7	1.99	8.4
3	16 18.7	16 22.1	59 45.86	1.129	59 58.43	0.960	7 54.3	2.07	9.4
4	16 24.9	16 27.0	60 8.76	+0.757	60 16.46	+0.521	8 45.4	2.20	10.4
5	16 28.3	16 28.7	60 21.16	+0.258	60 22.58	−0.025	9 40.2	2.38	11.4
6	16 28.1	16 26.6	60 20.50	−0.322	60 14.83	0.623	10 39.4	2.55	12.4
7	16 24.0	16 20.6	60 5.57	−0.918	59 52.87	−1.195	11 42.1	2.66	13.4
8	16 16.2	16 11.1	59 36.99	1.448	59 18.26	1.668	12 46.0	2.64	14.4
9	16 5.4	15 59.1	58 57.13	1.846	58 34.13	1.980	13 47.9	2.50	15.4
10	15 52.5	15 45.6	58 9.79	−2.069	57 44.65	−2.113	14 45.5	2.29	16.4
11	15 38.7	15 31.9	57 19.26	2.112	56 54.13	2.070	15 37.7	2.07	17.4
12	15 25.2	15 18.9	56 29.74	1.990	56 6.51	1.877	16 24.8	1.88	18.4
13	15 13.0	15 7.6	55 44.80	−1.737	55 24.91	−1.574	17 8.1	1.74	19.4
14	15 2.7	14 58.5	55 7.10	1.392	54 51.56	1.196	17 48.8	1.66	20.4
15	14 54.9	14 52.0	54 38.43	0.991	54 27.79	0.781	18 28.1	1.63	21.4
16	14 49.8	14 48.3	54 19.70	−0.568	54 14.16	−0.356	19 7.4	1.65	22.4
17	14 47.4	14 47.3	54 11.14	−0.148	54 10.58	+0.053	19 47.8	1.72	23.4
18	14 47.8	14 48.9	54 12.37	+0.244	54 16.40	0.425	20 30.5	1.84	24.4
19	14 50.6	14 52.7	54 22.52	+0.592	54 30.55	+0.744	21 16.2	1.98	25.4
20	14 55.4	14 58.5	54 40.30	0.879	54 51.57	0.997	22 5.6	2.13	26.4
21	15 1.9	15 5.6	55 4.15	1.097	55 17.82	1.178	22 58.5	2.26	27.4
22	15 9.6	15 13.7	55 32.35	+1.240	55 47.50	+1.283	23 53.8	2.33	28.4
23	15 18.0	15 22.3	56 3.07	1.309	56 18.86	1.319	6	. .	29.4
24	15 26.6	15 30.8	56 34.68	1.315	56 50.37	1.298	0 50.0	2.33	0.9
25	15 35.0	15 39.1	57 5.78	+1.270	57 20.81	+1.234	1 45.1	2.26	1.9
26	15 43.1	15 46.9	57 35.36	1.190	57 49.36	1.142	2 38.0	2.15	2.9
27	15 50.6	15 54.1	58 2.76	1.091	58 15.52	1.036	3 28.3	2.04	3.9
28	15 57.3	16 0.4	58 27.60	+0.977	58 38.96	+0.916	4 16.4	1.97	4.9
29	16 3.3	16 6.0	58 49.56	0.850	58 59.33	0.777	5 3.4	1.96	5.9
30	16 8.4	16 10.5	59 8.18	0.696	59 15.99	0.605	5 50.7	2.00	6.9
31	16 12.3	16 13.8	59 22.64	+0.502	59 27.97	+0.384	6 39.6	2.09	7.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 1.					WEDNESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 42 41.64	2.0813	N. 8 17 20.8	15.805	0	12 22 59.04	2.1324	S. 4 58 44.8	16.823
1	10 44 46.48	2.0802	8 1 30.9	15.858	1	12 25 7.08	2.1358	5 15 33.7	16.807
2	10 46 51.26	2.0793	7 45 37.8	15.910	2	12 27 15.33	2.1393	5 32 21.6	16.790
3	10 48 55.99	2.0785	7 29 41.7	15.961	3	12 29 23.79	2.1428	5 49 8.5	16.772
4	10 51 0.68	2.0778	7 13 42.5	16.011	4	12 31 32.46	2.1463	6 5 54.2	16.751
5	10 53 5.32	2.0770	6 57 40.4	16.058	5	12 33 41.35	2.1500	6 22 38.6	16.729
6	10 55 9.92	2.0764	6 41 35.5	16.104	6	12 35 50.46	2.1538	6 39 21.7	16.706
7	10 57 14.49	2.0759	6 25 27.9	16.150	7	12 37 59.80	2.1577	6 56 3.3	16.681
8	10 59 19.03	2.0754	6 9 17.5	16.195	8	12 40 9.38	2.1617	7 12 43.4	16.654
9	11 1 23.54	2.0751	5 53 4.5	16.237	9	12 42 19.20	2.1658	7 29 21.8	16.625
10	11 3 28.04	2.0749	5 36 49.1	16.278	10	12 44 29.27	2.1699	7 45 58.4	16.594
11	11 5 32.53	2.0748	5 20 31.1	16.319	11	12 46 39.59	2.1742	8 2 33.1	16.563
12	11 7 37.01	2.0747	5 4 10.8	16.358	12	12 48 50.17	2.1785	8 19 5.9	16.529
13	11 9 41.49	2.0747	4 47 48.2	16.395	13	12 51 1.01	2.1828	8 35 36.6	16.493
14	11 11 45.97	2.0748	4 31 23.4	16.432	14	12 53 12.11	2.1873	8 52 5.0	16.454
15	11 13 50.46	2.0749	4 14 56.4	16.468	15	12 55 23.49	2.1919	9 8 31.1	16.416
16	11 15 54.96	2.0752	3 58 27.3	16.501	16	12 57 35.14	2.1966	9 24 54.9	16.375
17	11 17 59.48	2.0756	3 41 56.3	16.533	17	12 59 47.08	2.2014	9 41 16.1	16.332
18	11 20 4.03	2.0760	3 25 23.4	16.563	18	13 1 59.31	2.2063	9 57 34.7	16.288
19	11 22 8.60	2.0765	3 8 48.7	16.593	19	13 4 11.83	2.2112	10 13 50.6	16.241
20	11 24 13.21	2.0772	2 52 12.2	16.622	20	13 6 24.65	2.2161	10 30 3.6	16.192
21	11 26 17.86	2.0779	2 35 34.1	16.648	21	13 8 37.76	2.2212	10 46 13.6	16.142
22	11 28 22.56	2.0788	2 18 54.4	16.673	22	13 10 51.19	2.2264	11 2 20.6	16.090
23	11 30 27.31	2.0797	N. 2 2 13.3	16.698	23	13 13 4.93	2.2317	S. 11 18 24.4	16.036
	TUESDAY 2.					THURSDAY 4.			
0	11 32 32.12	2.0807	N. 1 45 30.7	16.720	0	13 15 18.99	2.2370	S. 11 34 24.9	15.980
1	11 34 36.99	2.0818	1 28 46.9	16.741	1	13 17 33.37	2.2423	11 50 22.0	15.923
2	11 36 41.93	2.0829	1 12 1.8	16.762	2	13 19 48.07	2.2478	12 6 15.6	15.863
3	11 38 46.94	2.0842	0 55 15.5	16.780	3	13 22 3.10	2.2533	12 22 5.5	15.801
4	11 40 52.03	2.0855	0 38 28.2	16.797	4	13 24 18.47	2.2590	12 37 51.7	15.738
5	11 42 57.20	2.0869	0 21 39.9	16.813	5	13 26 34.18	2.2647	12 53 34.0	15.672
6	11 45 2.46	2.0885	N. 0 4 50.7	16.827	6	13 28 50.23	2.2704	13 9 12.3	15.604
7	11 47 7.82	2.0902	S. 0 11 59.3	16.839	7	13 31 6.63	2.2763	13 24 46.5	15.535
8	11 49 13.28	2.0919	0 28 50.0	16.850	8	13 33 23.38	2.2821	13 40 16.5	15.464
9	11 51 18.85	2.0938	0 45 41.3	16.860	9	13 35 40.48	2.2880	13 55 42.2	15.391
10	11 53 24.53	2.0957	1 2 33.2	16.868	10	13 37 57.94	2.2941	14 11 3.4	15.315
11	11 55 30.33	2.0977	1 19 25.5	16.875	11	13 40 15.77	2.3002	14 26 20.0	15.238
12	11 57 36.25	2.0998	1 36 18.2	16.880	12	13 42 33.96	2.3063	14 41 32.0	15.159
13	11 59 42.30	2.1020	1 53 11.1	16.883	13	13 44 52.52	2.3125	14 56 39.1	15.078
14	12 1 48.49	2.1043	2 10 4.2	16.886	14	13 47 11.46	2.3188	15 11 41.3	14.994
15	12 3 54.82	2.1067	2 26 57.4	16.887	15	13 49 30.77	2.3250	15 26 38.4	14.909
16	12 6 1.29	2.1092	2 43 50.6	16.886	16	13 51 50.46	2.3313	15 41 30.4	14.822
17	12 8 7.92	2.1118	3 0 43.7	16.883	17	13 54 10.53	2.3378	15 56 17.0	14.732
18	12 10 14.71	2.1145	3 17 36.6	16.879	18	13 56 30.99	2.3443	16 10 58.2	14.641
19	12 12 21.66	2.1172	3 34 29.2	16.874	19	13 58 51.84	2.3508	16 25 33.9	14.548
20	12 14 28.77	2.1200	3 51 21.5	16.868	20	14 1 13.08	2.3573	16 40 3.9	14.453
21	12 16 36.06	2.1230	4 8 13.3	16.858	21	14 3 34.71	2.3638	16 54 28.2	14.355
22	12 18 43.53	2.1261	4 25 4.5	16.848	22	14 5 56.74	2.3704	17 8 46.5	14.255
23	12 20 51.19	2.1293	4 41 55.0	16.836	23	14 8 19.16	2.3771	17 22 58.8	14.153
24	12 22 59.04	2.1324	S. 4 58 44.8	16.823	24	14 10 41.99	2.3838	S. 17 37 4.9	14.049

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 5.					**SUNDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 10 41.99	2.3838	S. 17 37 4.9	14.049	0	16 12 37.92	2.6750	S. 26 14 26.7	6.815
1	14 13 5.21	2.3904	17 51 4.7	13.944	1	16 15 18.54	2.6789	26 21 9.9	6.624
2	14 15 28.84	2.3973	18 4 58.2	13.837	2	16 17 59.39	2.6826	26 27 41.6	6.433
3	14 17 52.88	2.4040	18 18 45.1	13.727	3	16 20 40.45	2.6860	26 34 1.8	6.241
4	14 20 17.32	2.4108	18 32 25.4	13.615	4	16 23 21.71	2.6894	26 40 10.5	6.048
5	14 22 42.17	2.4176	18 45 58.9	13.501	5	16 26 3.18	2.6927	26 46 7.5	5.853
6	14 25 7.43	2.4243	18 59 25.5	13.384	6	16 28 44.83	2.6957	26 51 52.9	5.658
7	14 27 33.09	2.4312	19 12 45.0	13.266	7	16 31 26.66	2.6986	26 57 26.5	5.463
8	14 29 59.17	2.4381	19 25 57.4	13.147	8	16 34 8.66	2.7013	27 2 48.4	5.267
9	14 32 25.66	2.4449	19 39 2.6	13.024	9	16 36 50.81	2.7038	27 7 58.5	5.069
10	14 34 52.56	2.4517	19 52 0.3	12.900	10	16 39 33.11	2.7062	27 12 56.7	4.871
11	14 37 19.86	2.4585	20 4 50.6	12.774	11	16 42 15.55	2.7083	27 17 43.0	4.672
12	14 39 47.58	2.4654	20 17 33.2	12.646	12	16 44 58.11	2.7103	27 22 17.3	4.473
13	14 42 15.71	2.4722	20 30 8.1	12.516	13	16 47 40.78	2.7120	27 26 39.7	4.273
14	14 44 44.24	2.4790	20 42 35.1	12.383	14	16 50 23.55	2.7136	27 30 50.0	4.072
15	14 47 13.19	2.4858	20 54 54.1	12.250	15	16 53 6.41	2.7150	27 34 48.3	3.872
16	14 49 42.54	2.4926	21 7 5.1	12.114	16	16 55 49.35	2.7162	27 38 34.6	3.670
17	14 52 12.30	2.4993	21 19 7.8	11.975	17	16 58 32.35	2.7172	27 42 8.7	3.468
18	14 54 42.46	2.5060	21 31 2.1	11.835	18	17 1 15.41	2.7180	27 45 30.8	3.267
19	14 57 13.02	2.5127	21 42 48.0	11.693	19	17 3 58.51	2.7186	27 48 40.7	3.064
20	14 59 43.98	2.5194	21 54 25.2	11.548	20	17 6 41.64	2.7190	27 51 38.5	2.863
21	15 2 15.35	2.5261	22 5 53.8	11.403	21	17 9 24.79	2.7193	27 54 24.2	2.660
22	15 4 47.11	2.5326	22 17 13.6	11.256	22	17 12 7.95	2.7192	27 56 57.7	2.457
23	15 7 19.26	2.5391	S. 22 28 24.5	11.106	23	17 14 51.10	2.7191	S. 27 59 19.0	2.253
	SATURDAY 6.					**MONDAY 8.**			
0	15 9 51.80	2.5456	S. 22 39 26.3	10.954	0	17 17 34.24	2.7188	S. 28 1 28.1	2.051
1	15 12 24.73	2.5520	22 50 19.0	10.801	1	17 20 17.35	2.7181	28 3 25.1	1.848
2	15 14 58.04	2.5584	23 1 2.4	10.645	2	17 23 0.41	2.7173	28 5 9.9	1.646
3	15 17 31.74	2.5648	23 11 36.4	10.488	3	17 25 43.42	2.7163	28 6 42.6	1.443
4	15 20 5.81	2.5709	23 22 0.9	10.328	4	17 28 26.36	2.7150	28 8 3.1	1.241
5	15 22 40.25	2.5771	23 32 15.8	10.168	5	17 31 9.22	2.7137	28 9 11.5	1.039
6	15 25 15.06	2.5832	23 42 21.0	10.006	6	17 33 52.00	2.7121	28 10 7.8	0.838
7	15 27 50.23	2.5892	23 52 16.5	9.842	7	17 36 34.67	2.7102	28 10 52.0	0.636
8	15 30 25.76	2.5951	24 2 2.0	9.675	8	17 39 17.22	2.7082	28 11 24.1	0.435
9	15 33 1.64	2.6009	24 11 37.5	9.508	9	17 41 59.65	2.7060	28 11 44.2	0.235
10	15 35 37.87	2.6067	24 21 3.0	9.339	10	17 44 41.94	2.7036	28 11 52.3	−0.035
11	15 38 14.44	2.6123	24 30 18.2	9.168	11	17 47 24.08	2.7009	28 11 48.4	+0.164
12	15 40 51.35	2.6179	24 39 23.2	8.996	12	17 50 6.05	2.6981	28 11 32.6	0.363
13	15 43 28.59	2.6233	24 48 17.7	8.822	13	17 52 47.85	2.6951	28 11 4.8	0.562
14	15 46 6.15	2.6286	24 57 1.8	8.647	14	17 55 29.46	2.6919	28 10 25.2	0.759
15	15 48 44.02	2.6338	25 5 35.3	8.469	15	17 58 10.88	2.6886	28 9 33.7	0.957
16	15 51 22.21	2.6390	25 13 58.1	8.291	16	18 0 52.09	2.6850	28 8 30.4	1.152
17	15 54 0.70	2.6439	25 22 10.2	8.111	17	18 3 33.08	2.6813	28 7 15.5	1.346
18	15 56 39.48	2.6488	25 30 11.4	7.929	18	18 6 13.84	2.6773	28 5 48.9	1.541
19	15 59 18.55	2.6535	25 38 1.7	7.747	19	18 8 54.36	2.6733	28 4 10.6	1.735
20	16 1 57.90	2.6581	25 45 41.0	7.563	20	18 11 34.63	2.6689	28 2 20.7	1.927
21	16 4 37.52	2.6625	25 53 9.2	7.378	21	18 14 14.63	2.6644	28 0 19.4	2.118
22	16 7 17.40	2.6668	26 0 26.3	7.191	22	18 16 54.36	2.6598	27 58 6.6	2.308
23	16 9 57.54	2.6710	26 7 32.1	7.003	23	18 19 33.81	2.6551	27 55 42.4	2.498
24	16 12 37.92	2.6750	S. 26 14 26.7	6.815	24	18 22 12.97	2.6501	S. 27 53 6.9	2.686

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 9.					THURSDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 22 12.97	2.6501	S. 27 53 6.9	2.686	0	20 21 24.53	2.2893	S. 22 35 23.4	9.911
1	18 24 51.82	2.6448	27 50 20.1	2.873	1	20 23 41.63	2.2808	22 25 25.5	10.018
2	18 27 30.35	2.6396	27 47 22.2	3.058	2	20 25 58.22	2.2723	22 15 21.2	10.125
3	18 30 8.57	2.6342	27 44 13.2	3.243	3	20 28 14.30	2.2638	22 5 10.5	10.229
4	18 32 46.45	2.6285	27 40 53.1	3.426	4	20 30 29.88	2.2554	21 54 53.7	10.332
5	18 35 23.99	2.6227	27 37 22.1	3.608	5	20 32 44.95	2.2470	21 44 30.7	10.434
6	18 38 1.17	2.6168	27 33 40.2	3.788	6	20 34 59.52	2.2388	21 34 1.6	10.534
7	18 40 38.00	2.6108	27 29 47.5	3.968	7	20 37 13.60	2.2304	21 23 26.6	10.632
8	18 43 14.46	2.6046	27 25 44.1	4.145	8	20 39 27.17	2.2221	21 12 45.8	10.728
9	18 45 50.55	2.5983	27 21 30.1	4.322	9	20 41 40.25	2.2138	21 1 59.3	10.822
10	18 48 26.25	2.5918	27 17 5.5	4.497	10	20 43 52.83	2.2057	20 51 7.2	10.915
11	18 51 1.56	2.5853	27 12 30.5	4.670	11	20 46 4.93	2.1975	20 40 9.5	11.007
12	18 53 36.48	2.5786	27 7 45.1	4.843	12	20 48 16.53	2.1893	20 29 6.4	11.096
13	18 56 10.99	2.5717	27 2 49.4	5.013	13	20 50 27.65	2.1813	20 17 58.0	11.183
14	18 58 45.08	2.5647	26 57 43.5	5.182	14	20 52 38.28	2.1732	20 6 44.4	11.270
15	19 1 18.75	2.5577	26 52 27.6	5.349	15	20 54 48.43	2.1652	19 55 25.6	11.356
16	19 3 52.00	2.5505	26 47 1.6	5.516	16	20 56 58.10	2.1573	19 44 1.7	11.438
17	19 6 24.81	2.5433	26 41 25.7	5.679	17	20 59 7.30	2.1494	19 32 33.0	11.519
18	19 8 57.19	2.5359	26 35 40.1	5.842	18	21 1 16.03	2.1416	19 20 59.4	11.600
19	19 11 29.12	2.5284	26 29 44.7	6.003	19	21 3 24.29	2.1338	19 9 21.0	11.679
20	19 14 0.60	2.5209	26 23 39.7	6.163	20	21 5 32.09	2.1261	18 57 37.9	11.757
21	19 16 31.63	2.5133	26 17 25.2	6.320	21	21 7 39.42	2.1184	18 45 50.2	11.832
22	19 19 2.20	2.5056	26 11 1.3	6.476	22	21 9 46.30	2.1108	18 33 58.1	11.906
23	19 21 32.30	2.4978	S. 26 4 28.1	6.630	23	21 11 52.72	2.1033	S. 18 22 1.5	11.978
	WEDNESDAY 10.					FRIDAY 12.			
0	19 24 1.93	2.4899	S. 25 57 45.7	6.783	0	21 13 58.69	2.0958	S. 18 10 0.7	12.049
1	19 26 31.09	2.4820	25 50 54.2	6.933	1	21 16 4.22	2.0884	17 57 55.6	12.119
2	19 28 59.77	2.4739	25 43 53.7	7.082	2	21 18 9.30	2.0811	17 45 46.4	12.187
3	19 31 27.96	2.4658	25 36 44.4	7.229	3	21 20 13.95	2.0738	17 33 33.2	12.253
4	19 33 55.67	2.4578	25 29 26.2	7.375	4	21 22 18.16	2.0666	17 21 16.0	12.319
5	19 36 22.89	2.4496	25 21 59.4	7.518	5	21 24 21.94	2.0595	17 8 54.9	12.383
6	19 38 49.62	2.4414	25 14 24.0	7.660	6	21 26 25.30	2.0524	16 56 30.0	12.446
7	19 41 15.86	2.4332	25 6 40.2	7.801	7	21 28 28.23	2.0453	16 44 1.4	12.507
8	19 43 41.60	2.4248	24 58 47.9	7.940	8	21 30 30.74	2.0384	16 31 29.2	12.567
9	19 46 6.84	2.4165	24 50 47.4	8.076	9	21 32 32.84	2.0316	16 18 53.4	12.625
10	19 48 31.58	2.4081	24 42 38.8	8.210	10	21 34 34.53	2.0248	16 6 14.2	12.683
11	19 50 55.81	2.3997	24 34 22.2	8.343	11	21 36 35.82	2.0182	15 53 31.5	12.738
12	19 53 19.54	2.3913	24 25 57.6	8.475	12	21 38 36.71	2.0115	15 40 45.6	12.793
13	19 55 42.76	2.3828	24 17 25.2	8.604	13	21 40 37.20	2.0049	15 27 56.4	12.847
14	19 58 5.47	2.3743	24 8 45.1	8.732	14	21 42 37.30	1.9985	15 15 4.0	12.898
15	20 0 27.68	2.3658	23 59 57.4	8.858	15	21 44 37.02	1.9921	15 2 8.6	12.948
16	20 2 49.37	2.3573	23 51 2.2	8.982	16	21 46 36.35	1.9858	14 49 10.2	12.998
17	20 5 10.56	2.3488	23 41 59.6	9.104	17	21 48 35.31	1.9795	14 36 8.8	13.048
18	20 7 31.23	2.3403	23 32 49.7	9.224	18	21 50 33.89	1.9733	14 23 4.5	13.094
19	20 9 51.39	2.3318	23 23 32.7	9.343	19	21 52 32.11	1.9673	14 9 57.5	13.140
20	20 12 11.04	2.3233	23 14 8.6	9.460	20	21 54 29.97	1.9613	13 56 47.7	13.185
21	20 14 30.18	2.3148	23 4 37.5	9.576	21	21 56 27.47	1.9554	13 43 35.3	13.228
22	20 16 48.81	2.3062	22 54 59.5	9.689	22	21 58 24.62	1.9496	13 30 20.3	13.271
23	20 19 6.92	2.2977	22 45 14.8	9.801	23	22 0 21.42	1.9438	13 17 2.8	13.313
24	20 21 24.53	2.2893	S. 22 35 23.4	9.911	24	22 2 17.87	1.9381	S. 13 3 42.8	13.353

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 13.					MONDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 2 17.87	1.9381	S. 13 3 42.8	13.353	0	23 30 24.66	1.7659	S. 1 55 4.4	14.179
1	22 4 13.99	1.9326	12 50 20.5	13.392	1	23 32 10.57	1.7644	1 40 53.7	14.177
2	22 6 9.78	1.9271	12 36 55.8	13.430	2	23 33 56.39	1.7629	1 26 43.2	14.174
3	22 8 5.24	1.9216	12 23 28.9	13.467	3	23 35 42.12	1.7616	1 12 32.8	14.171
4	22 10 0.37	1.9163	12 9 59.8	13.503	4	23 37 27.78	1.7603	0 58 22.7	14.166
5	22 11 55.19	1.9111	11 56 28.6	13.537	5	23 39 13.36	1.7591	0 44 12.9	14.161
6	22 13 49.70	1.9059	11 42 55.4	13.571	6	23 40 58.87	1.7580	0 30 3.4	14.156
7	22 15 43.90	1.9008	11 29 20.1	13.603	7	23 42 44.32	1.7570	0 15 54.2	14.150
8	22 17 37.79	1.8958	11 15 43.0	13.634	8	23 44 29.71	1.7561	S. 0 1 45.4	14.143
9	22 19 31.39	1.8909	11 2 4.0	13.666	9	23 46 15.05	1.7553	N. 0 12 22.9	14.135
10	22 21 24.70	1.8861	10 48 23.1	13.696	10	23 48 0.34	1.7544	0 26 30.8	14.128
11	22 23 17.72	1.8813	10 34 40.5	13.724	11	23 49 45.58	1.7537	0 40 38.2	14.118
12	22 25 10.46	1.8767	10 20 56.2	13.752	12	23 51 30.78	1.7530	0 54 45.0	14.108
13	22 27 2.92	1.8721	10 7 10.3	13.778	13	23 53 15.94	1.7525	1 8 51.2	14.098
14	22 28 55.11	1.8677	9 53 22.8	13.804	14	23 55 1.08	1.7521	1 22 56.8	14.088
15	22 30 47.04	1.8633	9 39 33.8	13.829	15	23 56 46.19	1.7517	1 37 1.8	14.077
16	22 32 38.70	1.8589	9 25 43.3	13.853	16	23 58 31.28	1.7513	1 51 6.0	14.064
17	22 34 30.11	1.8548	9 11 51.4	13.876	17	0 0 16.35	1.7511	2 5 9.5	14.052
18	22 36 21.27	1.8506	8 57 58.2	13.898	18	0 2 1.41	1.7510	2 19 12.2	14.038
19	22 38 12.18	1.8465	8 44 3.7	13.919	19	0 3 46.47	1.7509	2 33 14.1	14.025
20	22 40 2.85	1.8425	8 30 7.9	13.939	20	0 5 31.52	1.7509	2 47 15.2	14.010
21	22 41 53.28	1.8386	8 16 11.0	13.958	21	0 7 16.58	1.7511	3 1 15.3	13.994
22	22 43 43.48	1.8348	8 2 12.9	13.977	22	0 9 1.65	1.7513	3 15 14.5	13.979
23	22 45 33.46	1.8312	S. 7 48 13.8	13.994	23	0 10 46.73	1.7514	N. 3 29 12.8	13.962
	SUNDAY 14.					TUESDAY 16.			
0	22 47 23.22	1.8275	S. 7 34 13.6	14.012	0	0 12 31.82	1.7518	N. 3 43 10.0	13.944
1	22 49 12.76	1.8240	7 20 12.4	14.028	1	0 14 16.94	1.7522	3 57 6.1	13.927
2	22 51 2.10	1.8206	7 6 10.3	14.043	2	0 16 2.08	1.7527	4 11 1.2	13.908
3	22 52 51.23	1.8172	6 52 7.3	14.057	3	0 17 47.26	1.7533	4 24 55.1	13.889
4	22 54 40.16	1.8138	6 38 3.5	14.070	4	0 19 32.47	1.7538	4 38 47.9	13.870
5	22 56 28.89	1.8106	6 23 58.9	14.083	5	0 21 17.72	1.7545	4 52 39.5	13.849
6	22 58 17.43	1.8076	6 9 53.5	14.095	6	0 23 3.01	1.7553	5 6 29.8	13.828
7	23 0 5.80	1.8046	5 55 47.5	14.106	7	0 24 48.36	1.7563	5 20 18.8	13.807
8	23 1 53.98	1.8016	5 41 40.8	14.117	8	0 26 33.76	1.7572	5 34 6.6	13.784
9	23 3 41.99	1.7987	5 27 33.5	14.126	9	0 28 19.22	1.7583	5 47 52.9	13.761
10	23 5 29.82	1.7958	5 13 25.7	14.134	10	0 30 4.75	1.7593	6 1 37.9	13.738
11	23 7 17.49	1.7932	4 59 17.4	14.142	11	0 31 50.34	1.7604	6 15 21.4	13.713
12	23 9 5.01	1.7907	4 45 8.7	14.149	12	0 33 36.01	1.7618	6 29 3.5	13.688
13	23 10 52.37	1.7882	4 30 59.5	14.156	13	0 35 21.75	1.7631	6 42 44.0	13.663
14	23 12 39.59	1.7858	4 16 50.0	14.161	14	0 37 7.58	1.7645	6 56 23.0	13.636
15	23 14 26.66	1.7833	4 2 40.2	14.166	15	0 38 53.49	1.7659	7 10 0.3	13.608
16	23 16 13.59	1.7811	3 48 30.1	14.170	16	0 40 39.49	1.7674	7 23 36.0	13.582
17	23 18 0.39	1.7789	3 34 19.8	14.173	17	0 42 25.58	1.7691	7 37 10.1	13.553
18	23 19 47.06	1.7768	3 20 9.3	14.177	18	0 44 11.78	1.7708	7 50 42.4	13.524
19	23 21 33.61	1.7748	3 5 58.6	14.180	19	0 45 58.08	1.7726	8 4 13.0	13.495
20	23 23 20.04	1.7728	2 51 47.7	14.181	20	0 47 44.49	1.7744	8 17 41.8	13.465
21	23 25 6.35	1.7709	2 37 36.9	14.181	21	0 49 31.01	1.7763	8 31 8.8	13.434
22	23 26 52.55	1.7693	2 23 26.0	14.181	22	0 51 17.65	1.7784	8 44 33.9	13.402
23	23 28 38.66	1.7676	2 9 15.2	14.180	23	0 53 4.42	1.7805	8 57 57.0	13.369
24	23 30 24.66	1.7659	S. 1 55 4.4	14.179	24	0 54 51.31	1.7826	N. 9 11 18.2	13.337

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 54 51.31	1.7826	N. 9 11 18.2	13.337	0	2 24 11.25	1.9636	N. 18 59 5.6	10.838
1	0 56 38.33	1.7848	9 24 37.4	13.303	1	2 26 9.22	1.9688	19 9 53.7	10.764
2	0 58 25.49	1.7871	9 37 54.5	13.268	2	2 28 7.50	1.9739	19 20 37.3	10.689
3	1 0 12.78	1.7894	9 51 9.5	13.233	3	2 30 6.09	1.9792	19 31 16.4	10.614
4	1 2 0.22	1.7919	10 4 22.5	13.198	4	2 32 5.00	1.9845	19 41 51.0	10.538
5	1 3 47.81	1.7944	10 17 33.3	13.161	5	2 34 4.23	1.9898	19 52 21.0	10.461
6	1 5 35.55	1.7969	10 30 41.8	13.123	6	2 36 3.78	1.9952	20 2 46.3	10.382
7	1 7 23.44	1.7996	10 43 48.0	13.085	7	2 38 3.65	2.0006	20 13 6.8	10.302
8	1 9 11.50	1.8023	10 56 52.0	13.047	8	2 40 3.85	2.0061	20 23 22.5	10.222
9	1 10 59.72	1.8051	11 9 53.6	13.008	9	2 42 4.38	2.0116	20 33 33.4	10.140
10	1 12 48.11	1.8079	11 22 52.9	12.968	10	2 44 5.24	2.0171	20 43 39.3	10.058
11	1 14 36.67	1.8108	11 35 49.7	12.926	11	2 46 6.43	2.0226	20 53 40.3	9.974
12	1 16 25.41	1.8139	11 48 44.0	12.884	12	2 48 7.95	2.0282	21 3 36.2	9.889
13	1 18 14.34	1.8170	12 1 35.8	12.842	13	2 50 9.81	2.0338	21 13 27.0	9.803
14	1 20 3.45	1.8201	12 14 25.0	12.799	14	2 52 12.00	2.0394	21 23 12.6	9.717
15	1 21 52.75	1.8233	12 27 11.7	12.756	15	2 54 14.54	2.0451	21 32 53.0	9.628
16	1 23 42.24	1.8265	12 39 55.7	12.710	16	2 56 17.41	2.0508	21 42 28.0	9.539
17	1 25 31.93	1.8298	12 52 36.9	12.664	17	2 58 20.63	2.0565	21 51 57.7	9.449
18	1 27 21.82	1.8333	13 5 15.4	12.618	18	3 0 24.19	2.0622	22 1 21.9	9.358
19	1 29 11.92	1.8368	13 17 51.1	12.572	19	3 2 28.09	2.0679	22 10 40.7	9.267
20	1 31 2.23	1.8403	13 30 24.0	12.524	20	3 4 32.34	2.0738	22 19 53.9	9.173
21	1 32 52.76	1.8439	13 42 54.0	12.475	21	3 6 36.94	2.0795	22 29 1.4	9.078
22	1 34 43.50	1.8475	13 55 21.0	12.426	22	3 8 41.88	2.0853	22 38 3.3	8.983
23	1 36 34.46	1.8513	N. 14 7 45.1	12.376	23	3 10 47.18	2.0912	N. 22 46 59.4	8.887
	THURSDAY 18.					SATURDAY 20.			
0	1 38 25.65	1.8551	N. 14 20 6.1	12.324	0	3 12 52.82	2.0969	N. 22 55 49.7	8.789
1	1 40 17.07	1.8589	14 32 24.0	12.273	1	3 14 58.81	2.1028	23 4 34.1	8.690
2	1 42 8.72	1.8628	14 44 38.8	12.220	2	3 17 5.16	2.1087	23 13 12.5	8.590
3	1 44 0.61	1.8668	14 56 50.4	12.166	3	3 19 11.85	2.1145	23 21 44.9	8.489
4	1 45 52.74	1.8708	15 8 58.7	12.112	4	3 21 18.90	2.1204	23 30 11.2	8.387
5	1 47 45.11	1.8749	15 21 3.8	12.057	5	3 23 26.30	2.1263	23 38 31.3	8.284
6	1 49 37.73	1.8791	15 33 5.5	12.001	6	3 25 34.05	2.1321	23 46 45.3	8.180
7	1 51 30.60	1.8833	15 45 3.9	11.944	7	3 27 42.15	2.1379	23 54 52.9	8.074
8	1 53 23.73	1.8877	15 56 58.8	11.886	8	3 29 50.60	2.1438	24 2 54.2	7.968
9	1 55 17.12	1.8920	16 8 50.2	11.828	9	3 31 59.40	2.1496	24 10 49.1	7.861
10	1 57 10.77	1.8963	16 20 38.1	11.768	10	3 34 8.55	2.1555	24 18 37.5	7.753
11	1 59 4.68	1.9008	16 32 22.4	11.708	11	3 36 18.06	2.1613	24 26 19.4	7.643
12	2 0 58.87	1.9054	16 44 3.0	11.646	12	3 38 27.91	2.1671	24 33 54.6	7.531
13	2 2 53.33	1.9099	16 55 39.9	11.584	13	3 40 38.11	2.1729	24 41 23.1	7.419
14	2 4 48.06	1.9145	17 7 13.1	11.521	14	3 42 48.66	2.1788	24 48 44.9	7.307
15	2 6 43.07	1.9192	17 18 42.4	11.457	15	3 44 59.56	2.1846	24 55 59.9	7.193
16	2 8 38.36	1.9239	17 30 7.9	11.392	16	3 47 10.81	2.1903	25 3 8.0	7.077
17	2 10 33.94	1.9288	17 41 29.4	11.326	17	3 49 22.40	2.1960	25 10 9.1	6.960
18	2 12 29.81	1.9336	17 52 47.0	11.259	18	3 51 34.33	2.2018	25 17 3.2	6.843
19	2 14 25.97	1.9385	18 4 0.5	11.192	19	3 53 46.61	2.2074	25 23 50.2	6.723
20	2 16 22.43	1.9434	18 15 10.0	11.123	20	3 55 59.22	2.2130	25 30 30.0	6.604
21	2 18 19.18	1.9483	18 26 15.3	11.053	21	3 58 12.17	2.2187	25 37 2.7	6.484
22	2 20 16.23	1.9534	18 37 16.3	10.982	22	4 0 25.46	2.2243	25 43 28.1	6.362
23	2 22 13.59	1.9585	18 48 13.1	10.911	23	4 2 39.08	2.2298	25 49 46.1	6.238
24	2 24 11.25	1.9636	N. 18 59 5.6	10.838	24	4 4 53.04	2.2354	N. 25 55 56.7	6.114

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 21.					TUESDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 4 53.04	2.2354	N. 25 55 56.7	6.114	0	5 57 16.94	2.4133	N. 28 8 47.5	0.867
1	4 7 7.33	2.2408	26 1 59.8	5.989	1	5 59 41.77	2.4143	28 7 50.7	1.027
2	4 9 21.94	2.2463	26 7 55.4	5.863	2	6 2 6.66	2.4154	28 6 44.3	1.187
3	4 11 36.88	2.2517	26 13 43.4	5.737	3	6 4 31.62	2.4164	28 5 28.3	1.347
4	4 13 52.14	2.2570	26 19 23.8	5.608	4	6 6 56.63	2.4172	28 4 2.7	1.507
5	4 16 7.72	2.2623	26 24 56.4	5.478	5	6 9 21.68	2.4178	28 2 27.5	1.667
6	4 18 23.61	2.2675	26 30 21.2	5.348	6	6 11 46.77	2.4185	28 0 42.7	1.828
7	4 20 39.82	2.2727	26 35 38.2	5.217	7	6 14 11.90	2.4190	27 58 48.2	1.988
8	4 22 56.33	2.2778	26 40 47.2	5.084	8	6 16 37.05	2.4193	27 56 44.1	2.149
9	4 25 13.15	2.2829	26 45 48.3	4.952	9	6 19 2.21	2.4194	27 54 30.3	2.309
10	4 27 30.28	2.2879	26 50 41.4	4.818	10	6 21 27.38	2.4196	27 52 7.0	2.469
11	4 29 47.70	2.2928	26 55 26.4	4.683	11	6 23 52.56	2.4196	27 49 34.0	2.631
12	4 32 5.42	2.2978	27 0 3.3	4.546	12	6 26 17.73	2.4193	27 46 51.3	2.792
13	4 34 23.43	2.3025	27 4 31.9	4.408	13	6 28 42.88	2.4191	27 43 59.0	2.953
14	4 36 41.72	2.3073	27 8 52.3	4.271	14	6 31 8.02	2.4188	27 40 57.0	3.113
15	4 39 0.30	2.3120	27 13 4.4	4.132	15	6 33 33.13	2.4182	27 37 45.5	3.273
16	4 41 19.16	2.3166	27 17 8.1	3.992	16	6 35 58.20	2.4176	27 34 24.3	3.433
17	4 43 38.29	2.3211	27 21 3.4	3.851	17	6 38 23.24	2.4168	27 30 53.6	3.593
18	4 45 57.69	2.3255	27 24 50.2	3.708	18	6 40 48.22	2.4159	27 27 13.2	3.753
19	4 48 17.35	2.3298	27 28 28.4	3.566	19	6 43 13.15	2.4150	27 23 23.3	3.912
20	4 50 37.27	2.3342	27 31 58.1	3.423	20	6 45 38.02	2.4139	27 19 23.8	4.071
21	4 52 57.45	2.3383	27 35 19.2	3.279	21	6 48 2.82	2.4128	27 15 14.8	4.229
22	4 55 17.87	2.3424	27 38 31.6	3.133	22	6 50 27.55	2.4115	27 10 56.3	4.388
23	4 57 38.54	2.3465	N. 27 41 35.2	2.987	23	6 52 52.20	2.4101	N. 27 6 28.2	4.547
	MONDAY 22.					WEDNESDAY 24.			
0	4 59 59.45	2.3504	N. 27 44 30.0	2.840	0	6 55 16.76	2.4085	N. 27 1 50.7	4.704
1	5 2 20.59	2.3543	27 47 16.0	2.693	1	6 57 41.22	2.4069	26 57 3.7	4.862
2	5 4 41.96	2.3580	27 49 53.2	2.545	2	7 0 5.59	2.4053	26 52 7.3	5.018
3	5 7 3.55	2.3616	27 52 21.4	2.396	3	7 2 29.85	2.4034	26 47 1.5	5.175
4	5 9 25.35	2.3652	27 54 40.7	2.246	4	7 4 54.00	2.4015	26 41 46.3	5.332
5	5 11 47.37	2.3687	27 56 50.9	2.096	5	7 7 18.03	2.3994	26 36 21.7	5.488
6	5 14 9.59	2.3719	27 58 52.2	1.945	6	7 9 41.93	2.3973	26 30 47.8	5.643
7	5 16 32.00	2.3752	28 0 44.3	1.793	7	7 12 5.70	2.3951	26 25 4.6	5.797
8	5 18 54.61	2.3783	28 2 27.3	1.640	8	7 14 29.34	2.3928	26 19 12.2	5.950
9	5 21 17.40	2.3814	28 4 1.1	1.488	9	7 16 52.84	2.3904	26 13 10.6	6.103
10	5 23 40.38	2.3843	28 5 25.8	1.334	10	7 19 16.19	2.3879	26 6 59.8	6.257
11	5 26 3.52	2.3871	28 6 41.2	1.179	11	7 21 39.39	2.3853	26 0 39.8	6.409
12	5 28 26.83	2.3898	28 7 47.3	1.024	12	7 24 2.43	2.3827	25 54 10.7	6.560
13	5 30 50.30	2.3924	28 8 44.1	0.869	13	7 26 25.31	2.3799	25 47 32.6	6.711
14	5 33 13.92	2.3949	28 9 31.6	0.713	14	7 28 48.02	2.3771	25 40 45.4	6.861
15	5 35 37.69	2.3973	28 10 9.7	0.558	15	7 31 10.56	2.3742	25 33 49.3	7.010
16	5 38 1.59	2.3994	28 10 38.5	0.401	16	7 33 32.92	2.3712	25 26 44.2	7.159
17	5 40 25.62	2.4016	28 10 57.8	0.243	17	7 35 55.10	2.3682	25 19 30.2	7.307
18	5 42 49.78	2.4036	28 11 7.7	+0.086	18	7 38 17.10	2.3650	25 12 7.4	7.453
19	5 45 14.05	2.4055	28 11 8.1	−0.073	19	7 40 38.90	2.3618	25 4 35.8	7.599
20	5 47 38.44	2.4073	28 10 59.0	0.231	20	7 43 0.52	2.3586	24 56 55.5	7.745
21	5 50 2.93	2.4089	28 10 40.4	0.389	21	7 45 21.93	2.3552	24 49 6.4	7.890
22	5 52 27.51	2.4104	28 10 12.3	0.548	22	7 47 43.14	2.3518	24 41 8.7	8.033
23	5 54 52.18	2.4119	28 9 34.7	0.707	23	7 50 4.15	2.3484	24 33 2.4	8.176
24	5 57 16.94	2.4133	N. 28 8 47.5	0.867	24	7 52 24.95	2.3448	N. 24 24 47.6	8.318

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
THURSDAY 25.					**SATURDAY 27.**				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 52 24.95	2.3448	N. 24 24 47.6	8.318	0	9 40 23.17	2.1540	N. 15 22 7.1	13.840
1	7 54 45.53	2.3413	24 16 24.3	8.459	1	9 42 32.30	2.1504	15 8 14.2	13.924
2	7 57 5.90	2.3377	24 7 52.5	8.600	2	9 44 41.22	2.1468	14 54 16.2	14.008
3	7 59 26.05	2.3340	23 59 12.3	8.739	3	9 46 49.92	2.1433	14 40 13.2	14.091
4	8 1 45.98	2.3303	23 50 23.8	8.878	4	9 48 58.42	2.1400	14 26 5.3	14.172
5	8 4 5.68	2.3264	23 41 27.0	9.015	5	9 51 6.72	2.1366	14 11 52.6	14.251
6	8 6 25.15	2.3227	23 32 22.0	9.151	6	9 53 14.82	2.1333	13 57 35.2	14.329
7	8 8 44.40	2.3188	23 23 8.9	9.286	7	9 55 22.72	2.1301	13 43 13.1	14.407
8	8 11 3.41	2.3149	23 13 47.7	9.420	8	9 57 30.43	2.1268	13 28 46.4	14.482
9	8 13 22.19	2.3110	23 4 18.5	9.553	9	9 59 37.94	2.1237	13 14 15.3	14.556
10	8 15 40.73	2.3070	22 54 41.3	9.686	10	10 1 45.27	2.1206	12 59 39.7	14.630
11	8 17 59.03	2.3030	22 44 56.2	9.817	11	10 3 52.41	2.1176	12 44 59.7	14.702
12	8 20 17.09	2.2990	22 35 3.3	9.947	12	10 5 59.38	2.1147	12 30 15.5	14.772
13	8 22 34.91	2.2949	22 25 2.6	10.076	13	10 8 6.17	2.1118	12 15 27.1	14.841
14	8 24 52.48	2.2908	22 14 54.2	10.203	14	10 10 12.79	2.1089	12 0 34.6	14.908
15	8 27 9.81	2.2868	22 4 38.2	10.330	15	10 12 19.24	2.1062	11 45 38.1	14.974
16	8 29 26.89	2.2827	21 54 14.6	10.456	16	10 14 25.53	2.1035	11 30 37.7	15.040
17	8 31 43.73	2.2786	21 43 43.5	10.580	17	10 16 31.66	2.1008	11 15 33.3	15.104
18	8 34 0.32	2.2743	21 33 5.0	10.703	18	10 18 37.63	2.0983	11 0 25.2	15.167
19	8 36 16.65	2.2702	21 22 19.1	10.826	19	10 20 43.45	2.0958	10 45 13.3	15.228
20	8 38 32.74	2.2661	21 11 25.9	10.948	20	10 22 49.12	2.0933	10 29 57.9	15.288
21	8 40 48.58	2.2619	21 0 25.4	11.068	21	10 24 54.64	2.0908	10 14 38.8	15.347
22	8 43 4.17	2.2578	20 49 17.8	11.186	22	10 27 0.02	2.0886	9 59 16.3	15.403
23	8 45 19.51	2.2535	N. 20 38 3.1	11.303	23	10 29 5.27	2.0864	N. 9 43 50.4	15.460
FRIDAY 26.					**SUNDAY 28.**				
0	8 47 34.59	2.2493	N. 20 26 41.4	11.420	0	10 31 10.39	2.0843	N. 9 28 21.1	15.515
1	8 49 49.42	2.2452	20 15 12.7	11.535	1	10 33 15.38	2.0822	9 12 48.6	15.568
2	8 52 4.01	2.2410	20 3 37.2	11.648	2	10 35 20.25	2.0802	8 57 13.0	15.619
3	8 54 18.34	2.2368	19 51 54.9	11.761	3	10 37 25.00	2.0783	8 41 34.3	15.670
4	8 56 32.42	2.2326	19 40 5.9	11.873	4	10 39 29.64	2.0764	8 25 52.6	15.720
5	8 58 46.25	2.2284	19 28 10.2	11.983	5	10 41 34.17	2.0747	8 10 7.9	15.768
6	9 0 59.83	2.2243	19 16 7.9	12.093	6	10 43 38.60	2.0729	7 54 20.4	15.814
7	9 3 13.17	2.2203	19 3 59.1	12.200	7	10 45 42.92	2.0713	7 38 30.2	15.860
8	9 5 26.26	2.2161	18 51 43.9	12.307	8	10 47 47.15	2.0698	7 22 37.2	15.904
9	9 7 39.10	2.2119	18 39 22.3	12.413	9	10 49 51.29	2.0683	7 6 41.7	15.947
10	9 9 51.69	2.2078	18 26 54.4	12.517	10	10 51 55.35	2.0669	6 50 43.6	15.989
11	9 12 4.04	2.2038	18 14 20.3	12.619	11	10 53 59.32	2.0656	6 34 43.0	16.029
12	9 14 16.14	2.1998	18 1 40.1	12.721	12	10 56 3.22	2.0644	6 18 40.1	16.068
13	9 16 28.01	2.1958	17 48 53.8	12.821	13	10 58 7.05	2.0633	6 2 34.9	16.105
14	9 18 39.63	2.1918	17 36 1.6	12.920	14	11 0 10.81	2.0623	5 46 27.5	16.141
15	9 20 51.02	2.1879	17 23 3.4	13.018	15	11 2 14.52	2.0613	5 30 18.0	16.175
16	9 23 2.18	2.1840	17 9 59.5	13.113	16	11 4 18.17	2.0604	5 14 6.5	16.208
17	9 25 13.10	2.1801	16 56 49.8	13.209	17	11 6 21.77	2.0596	4 57 53.0	16.241
18	9 27 23.79	2.1763	16 43 34.4	13.303	18	11 8 25.32	2.0588	4 41 37.6	16.272
19	9 29 34.25	2.1724	16 30 13.4	13.397	19	11 10 28.83	2.0583	4 25 20.4	16.302
20	9 31 44.48	2.1686	16 16 46.8	13.488	20	11 12 32.31	2.0578	4 9 1.4	16.330
21	9 33 54.48	2.1648	16 3 14.9	13.577	21	11 14 35.76	2.0573	3 52 40.8	16.357
22	9 36 4.26	2.1612	15 49 37.6	13.666	22	11 16 39.18	2.0568	3 36 18.6	16.382
23	9 38 13.82	2.1576	15 35 55.0	13.754	23	11 18 42.58	2.0566	3 19 55.0	16.406
24	9 40 23.17	2.1540	N. 15 22 7.1	13.840	24	11 20 45.97	2.0564	N. 3 3 29.9	16.429

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	11 20 45.97	2.0564	N. 3 3 29.9	16.429
1	11 22 49.35	2.0563	2 47 3.5	16.450
2	11 24 52.72	2.0563	2 30 35.9	16.470
3	11 26 56.10	2.0564	2 14 7.1	16.489
4	11 28 59.49	2.0566	1 57 37.2	16.507
5	11 31 2.89	2.0568	1 41 6.3	16.523
6	11 33 6.30	2.0571	1 24 34.5	16.538
7	11 35 9.74	2.0576	1 8 1.8	16.551
8	11 37 13.21	2.0581	0 51 28.4	16.563
9	11 39 16.71	2.0587	0 34 54.3	16.573
10	11 41 20.25	2.0594	0 18 19.7	16.582
11	11 43 23.84	2.0603	N. 0 1 44.5	16.590
12	11 45 27.48	2.0611	S. 0 14 51.1	16.596
13	11 47 31.17	2.0621	0 31 27.0	16.601
14	11 49 34.93	2.0632	0 48 3.2	16.605
15	11 51 38.75	2.0643	1 4 39.6	16.607
16	11 53 42.65	2.0656	1 21 16.0	16.608
17	11 55 46.62	2.0669	1 37 52.5	16.608
18	11 57 50.68	2.0684	1 54 28.9	16.606
19	11 59 54.83	2.0699	2 11 5.2	16.603
20	12 1 59.07	2.0715	2 27 41.2	16.597
21	12 4 3.41	2.0733	2 44 16.8	16.591
22	12 6 7.86	2.0751	3 0 52.1	16.584
23	12 8 12.42	2.0770	S. 3 17 26.9	16.575

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	12 10 17.10	2.0790	S. 3 34 1.1	16.564
1	12 12 21.90	2.0811	3 50 34.6	16.552
2	12 14 26.83	2.0833	4 7 7.3	16.538
3	12 16 31.89	2.0855	4 23 39.2	16.524
4	12 18 37.09	2.0879	4 40 10.2	16.508
5	12 20 42.44	2.0903	4 56 40.1	16.489
6	12 22 47.93	2.0928	5 13 8.9	16.471
7	12 24 53.58	2.0955	5 29 36.6	16.451
8	12 26 59.39	2.0983	5 46 3.0	16.428
9	12 29 5.37	2.1011	6 2 27.9	16.403
10	12 31 11.52	2.1040	6 18 51.4	16.379
11	12 33 17.85	2.1070	6 35 13.4	16.353
12	12 35 24.36	2.1101	6 51 33.7	16.324
13	12 37 31.06	2.1133	7 7 52.3	16.294
14	12 39 37.95	2.1165	7 24 9.0	16.263
15	12 41 45.04	2.1199	7 40 23.8	16.231
16	12 43 52.34	2.1233	7 56 36.7	16.197
17	12 45 59.85	2.1269	8 12 47.4	16.160
18	12 48 7.57	2.1306	8 28 55.9	16.123
19	12 50 15.52	2.1343	8 45 2.1	16.084
20	12 52 23.69	2.1381	9 1 6.0	16.044
21	12 54 32.09	2.1419	9 17 7.4	16.002
22	12 56 40.72	2.1459	9 33 6.2	15.958
23	12 58 49.60	2.1500	9 49 2.3	15.913
24	13 0 58.72	2.1542	S. 10 4 55.7	15.866

WEDNESDAY, JULY 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	13 0 58.72	2.1542	S. 10 4 55.7	15.866

PHASES OF THE MOON.

			d	h	m
☽	First Quarter . . .	June	1	2	3.0
○	Full Moon		7	17	18.3
☾	Last Quarter		15	2	20.0
●	New Moon		23	3	33.2
☽	First Quarter		30	7	24.5

			d	h
☾	Perigee	June	5	11.0
☾	Apogee		17	8.9

JULY, 1914.

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.	Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	6 38 15.93	10.348	N.23 9 39.7	− 9.46	15 45.70	68.76	3 28.50	0.489
Thur.	2	6 42 24.13	10.336	23 5 40.5	10.47	15 45.69	68.73	3 40.11	0.478
Frid.	3	6 46 32.06	10.324	23 1 17.1	11.48	15 45.69	68.70	3 51.44	0.466
Sat.	4	6 50 39.67	10.311	22 56 29.6	−12.48	15 45.69	68.66	4 2.47	0.453
SUN.	5	6 54 46.98	10.298	22 51 18.2	13.47	15 45.70	68.62	4 13.19	0.440
Mon.	6	6 58 53.95	10.284	22 45 43.0	14.46	15 45.71	68.57	4 23.57	0.425
Tues.	7	7 3 0.57	10.269	22 39 44.1	−15.44	15 45.72	68.52	4 33.60	0.410
Wed.	8	7 7 6.83	10.253	22 33 21.7	16.42	15 45.74	68.47	4 43.27	0.395
Thur.	9	7 11 12.71	10.237	22 26 35.9	17.39	15 45.76	68.41	4 52.57	0.379
Frid.	10	7 15 18.19	10.220	22 19 26.9	−18.36	15 45.78	68.35	5 1.47	0.362
Sat.	11	7 19 23.27	10.203	22 11 54.7	19.32	15 45.81	68.29	5 9.97	0.345
SUN.	12	7 23 27.93	10.185	22 3 59.6	20.27	15 45.84	68.23	5 18.05	0.328
Mon.	13	7 27 32.15	10.167	21 55 41.7	−21.21	15 45.88	68.16	5 25.71	0.310
Tues.	14	7 31 35.93	10.148	21 47 1.2	22.15	15 45.92	68.10	5 32.92	0.291
Wed.	15	7 35 39.26	10.129	21 37 58.4	23.08	15 45.96	68.03	5 39.66	0.271
Thur.	16	7 39 42.11	10.109	21 28 33.4	−24.00	15 46.00	67.96	5 45.92	0.251
Frid.	17	7 43 44.46	10.088	21 18 46.4	24.91	15 46.05	67.89	5 51.70	0.231
Sat.	18	7 47 46.31	10.067	21 8 37.6	25.81	15 46.10	67.82	5 56.98	0.210
SUN.	19	7 51 47.64	10.045	20 58 7.2	−26.71	15 46.16	67.74	6 1.75	0.188
Mon.	20	7 55 48.45	10.023	20 47 15.5	27.60	15 46.23	67.67	6 5.99	0.166
Tues.	21	7 59 48.72	10.000	20 36 2.6	28.47	15 46.30	67.59	6 9.69	0.143
Wed.	22	8 3 48.44	9.976	20 24 28.9	−29.33	15 46.38	67.51	6 12.84	0.120
Thur.	23	8 7 47.58	9.952	20 12 34.7	30.19	15 46.46	67.43	6 15.42	0.096
Frid.	24	8 11 46.14	9.928	20 0 20.1	31.03	15 46.55	67.35	6 17.42	0.072
Sat.	25	8 15 44.12	9.903	19 47 45.5	−31.86	15 46.65	67.26	6 18.84	0.047
SUN.	26	8 19 41.50	9.878	19 34 51.1	32.68	15 46.75	67.18	6 19.66	0.022
Mon.	27	8 23 38.27	9.853	19 21 37.3	33.48	15 46.85	67.09	6 19.87	0.004
Tues.	28	8 27 34.43	9.827	19 8 4.3	−34.27	15 46.96	67.01	6 19.47	0.029
Wed.	29	8 31 29.96	9.801	18 54 12.4	35.04	15 47.07	66.92	6 18.45	0.055
Thur.	30	8 35 24.87	9.775	18 40 2.0	35.81	15 47.19	66.84	6 16.81	0.081
Frid.	31	8 39 19.15	9.749	18 25 33.3	36.57	15 47.31	66.75	6 14.54	0.107
Sat.	32	8 43 12.80	9.723	N.18 10 46.6	−37.32	15 47.43	66.67	6 11.64	0.133

Note.—The mean time of semidiameter passing meridian may be found by subtracting 0s.19 from the sidereal time. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	6 38 15.33	10.346	N.23 9 40.2	− 9.46	3 28.47	0.489	6 34 46.87
Thur.	2	6 42 23.50	10.334	23 5 41.1	10.46	3 40.08	0.478	6 38 43.42
Frid.	3	6 46 31.39	10.322	23 1 17.8	11.46	3 51.41	0.466	6 42 39.98
Sat.	4	6 50 38.98	10.309	22 56 30.4	−12.46	4 2.44	0.453	6 46 36.54
SUN.	5	6 54 46.26	10.296	22 51 19.1	13.46	4 13.16	0.440	6 50 33.10
Mon.	6	6 58 53.20	10.282	22 45 44.0	14.45	4 23.54	0.425	6 54 29.66
Tues.	7	7 2 59.79	10.267	22 39 45.3	−15.44	4 33.57	0.410	6 58 26.22
Wed.	8	7 7 6.02	10.252	22 33 23.0	16.42	4 43.24	0.395	7 2 22.77
Thur.	9	7 11 11.87	10.236	22 26 37.3	17.39	4 52.54	0.379	7 6 19.33
Frid.	10	7 15 17.33	10.219	22 19 28.4	−18.35	5 1.44	0.362	7 10 15.89
Sat.	11	7 19 22.39	10.202	22 11 56.4	19.31	5 9.94	0.345	7 14 12.45
SUN.	12	7 23 27.03	10.184	22 4 1.4	20.26	5 18.02	0.328	7 18 9.01
Mon.	13	7 27 31.24	10.166	21 55 43.6	−21.21	5 25.67	0.310	7 22 5.56
Tues.	14	7 31 35.00	10.147	21 47 3.3	22.15	5 32.88	0.291	7 26 2.12
Wed.	15	7 35 38.31	10.128	21 38 0.6	23.08	5 39.63	0.271	7 29 58.68
Thur.	16	7 39 41.14	10.108	21 28 35.7	−24.00	5 45.90	0.251	7 33 55.24
Frid.	17	7 43 43.48	10.087	21 18 48.8	24.91	5 51.68	0.231	7 37 51.80
Sat.	18	7 47 45.32	10.066	21 8 40.1	25.81	5 56.96	0.210	7 41 48.36
SUN.	19	7 51 46.64	10.044	20 58 9.8	−26.71	6 1.73	0.188	7 45 44.91
Mon.	20	7 55 47.44	10.022	20 47 18.2	27.59	6 5.97	0.166	7 49 41.47
Tues.	21	7 59 47.70	9.999	20 36 5.5	28.46	6 9.68	0.143	7 53 38.03
Wed.	22	8 3 47.41	9.976	20 24 31.9	−29.32	6 12.83	0.120	7 57 34.58
Thur.	23	8 7 46.55	9.952	20 12 37.8	30.18	6 15.41	0.096	8 1 31.14
Frid.	24	8 11 45.11	9.928	20 0 23.3	31.02	6 17.42	0.072	8 5 27.70
Sat.	25	8 15 43.09	9.903	19 47 48.8	−31.85	6 18.84	0.047	8 9 24.26
SUN.	26	8 19 40.47	9.878	19 34 54.5	32.67	6 19.66	0.022	8 13 20.81
Mon.	27	8 23 37.24	9.853	19 21 40.8	33.47	6 19.87	0.004	8 17 17.37
Tues.	28	8 27 33.40	9.827	19 8 7.9	−34.26	6 19.47	0.029	8 21 13.93
Wed.	29	8 31 28.94	9.801	18 54 16.1	35.04	6 18.45	0.055	8 25 10.48
Thur.	30	8 35 23.85	9.775	18 40 5.8	35.81	6 16.81	0.081	8 29 7.04
Frid.	31	8 39 18.14	9.749	18 25 37.1	36.56	6 14.54	0.107	8 33 3.60
Sat.	32	8 43 11.80	9.723	N.18 10 50.4	−37.31	6 11.65	0.133	8 37 0.16

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	182	98 47 32.2	47 0.8	143.00	−0.22	0.007 1983	+ 1.1	17 22 21.90
2	183	99 44 43.9	44 12.3	142.98	0.33	0.007 2001	+ 0.4	17 18 25.99
3	184	100 41 55.3	41 23.5	142.97	0.38	0.007 2000	− 0.3	17 14 30.08
4	185	101 39 6.4	38 34.5	142.96	−0.42	0.007 1984	− 1.0	17 10 34.16
5	186	102 36 17.4	35 45.2	142.95	0.41	0.007 1951	1.6	17 6 38.25
6	187	103 33 28.2	32 55.9	142.95	0.38	0.007 1904	2.3	17 2 42.34
7	188	104 30 39.1	30 6.5	142.95	−0.32	0.007 1842	− 2.9	16 58 46.43
8	189	105 27 50.0	27 17.3	142.96	0.24	0.007 1767	3.5	16 54 50.51
9	190	106 25 1.1	24 28.2	142.97	0.13	0.007 1677	4.1	16 50 54.60
10	191	107 22 12.5	21 39.4	142.98	−0.02	0.007 1572	− 4.7	16 46 58.69
11	192	108 19 24.3	18 51.0	143.00	+0.11	0.007 1452	5.4	16 43 2.78
12	193	109 16 36.5	16 3.1	143.02	0.24	0.007 1315	6.1	16 39 6.86
13	194	110 13 49.3	13 15.6	143.04	+0.36	0.007 1160	− 6.8	16 35 10.95
14	195	111 11 2.5	10 28.7	143.06	0.47	0.007 0987	7.6	16 31 15.04
15	196	112 8 16.4	7 42.4	143.09	0.57	0.007 0795	8.4	16 27 19.13
16	197	113 5 30.9	4 56.7	143.11	+0.64	0.007 0582	− 9.3	16 23 23.22
17	198	114 2 46.0	2 11.6	143.14	0.69	0.007 0348	10.2	16 19 27.30
18	199	114 60 1.8	59 27.2	143.17	0.70	0.007 0092	11.1	16 15 31.39
19	200	115 57 18.2	56 43.5	143.20	+0.70	0.006 9814	−12.1	16 11 35.48
20	201	116 54 35.3	54 0.4	143.23	0.67	0.006 9511	13.1	16 7 39.57
21	202	117 51 53.2	51 18.1	143.26	0.60	0.006 9183	14.2	16 3 43.66
22	203	118 49 11.6	48 36.4	143.29	+0.52	0.006 8831	−15.2	15 59 47.75
23	204	119 46 30.7	45 55.3	143.31	0.40	0.006 8452	16.3	15 55 51.84
24	205	120 43 50.4	43 14.8	143.33	0.27	0.006 8048	17.4	15 51 55.92
25	206	121 41 10.6	40 34.8	143.35	+0.13	0.006 7620	−18.4	15 48 0.01
26	207	122 38 31.3	37 55.4	143.37	0.00	0.006 7165	19.4	15 44 4.10
27	208	123 35 52.5	35 16.4	143.39	−0.14	0.006 6688	20.4	15 40 8.19
28	209	124 33 14.2	32 38.0	143.41	−0.27	0.006 6188	−21.3	15 36 12.28
29	210	125 30 36.4	30 0.0	143.43	0.36	0.006 5666	22.1	15 32 16.37
30	211	126 27 59.0	27 22.5	143.45	0.43	0.006 5125	22.9	15 28 20.46
31	212	127 25 22.2	24 45.5	143.48	0.48	0.006 4567	23.6	15 24 24.54
32	213	128 22 46.0	22 9.1	143.50	−0.47	0.006 3992	−24.3	15 20 28.63

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
$-9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 12.3	16 13.8	59 22.64	+0.502	59 27.97	+0.384	6 39.6	2.09	7.9
2	16 14.8	16 15.4	59 31.79	+0.250	59 33.92	+0.103	7 31.4	2.24	8.9
3	16 15.5	16 15.0	59 34.20	−0.059	59 32.44	−0.236	8 27.2	2.42	9.9
4	16 13.9	16 12.2	59 28.50	−0.422	59 22.29	−0.614	9 27.0	2.56	10.9
5	16 9.9	16 7.0	59 13.75	0.808	59 2.91	0.997	10 29.3	2.61	11.9
6	16 3.4	15 59.3	58 49.86	1.175	58 34.77	1.338	11 31.6	2.55	12.9
7	15 54.7	15 49.6	58 17.84	−1.480	57 59.35	−1.597	12 31.1	2.39	13.9
8	15 44.3	15 38.7	57 39.64	1.683	57 19.09	1.737	13 26.0	2.18	14.9
9	15 32.9	15 27.2	56 58.08	1.760	56 36.98	1.749	14 15.8	1.98	15.9
10	15 21.5	15 16.1	56 16.25	−1.703	55 56.24	−1.628	15 1.3	1.82	16.9
11	15 10.9	15 6.1	55 37.29	1.526	55 19.71	1.398	15 43.5	1.71	17.9
12	15 1.8	14 58.0	55 3.83	1.246	54 49.88	1.076	16 23.8	1.66	18.9
13	14 54.8	14 52.2	54 38.06	−0.891	54 28.54	−0.693	17 3.4	1.65	19.9
14	14 50.3	14 49.0	54 21.47	0.485	54 16.93	−0.271	17 43.4	1.69	20.9
15	14 48.5	14 48.7	54 14.97	−0.055	54 15.61	+0.160	18 25.0	1.78	21.9
16	14 49.5	14 51.1	54 18.80	+0.372	54 24.50	+0.577	19 9.3	1.91	22.9
17	14 53.3	14 56.1	54 32.61	0.772	54 42.99	0.955	19 57.0	2.06	23.9
18	14 59.5	15 3.4	54 55.48	1.122	55 9.85	1.270	20 48.4	2.21	24.9
19	15 7.8	15 12.5	55 25.86	+1.396	55 43.25	+1.498	21 42.9	2.32	25.9
20	15 17.6	15 22.8	56 1.70	1.574	56 20.90	1.622	22 39.3	2.36	26.9
21	15 28.2	15 33.5	56 40.50	1.639	57 0.12	1.627	23 35.7	2.32	27.9
22	15 38.7	15 43.8	57 19.44	+1.588	57 38.13	+1.522	6	. .	28.9
23	15 48.7	15 53.2	57 55.86	1.429	58 12.34	1.314	0 30.5	2.23	0.4
24	15 57.3	16 0.9	58 27.33	1.182	58 40.65	1.037	1 22.8	2.13	1.4
25	16 4.0	16 6.7	58 52.18	+0.884	59 1.84	+0.726	2 12.7	2.04	2.4
26	16 8.8	16 10.4	59 9.60	0.569	59 15.50	0.415	3 0.9	1.99	3.4
27	16 11.5	16 12.2	59 19.59	+0.268	59 21.96	+0.129	3 48.6	2.00	4.4
28	16 12.4	16 12.2	59 22.73	0.000	59 22.01	−0.119	4 37.1	2.06	5.4
29	16 11.6	16 10.7	59 19.91	−0.230	59 16.52	0.334	5 27.8	2.17	6.4
30	16 9.4	16 7.9	59 11.93	0.430	59 6.21	0.522	6 21.6	2.32	7.4
31	16 6.0	16 3.8	58 59.40	0.613	58 51.51	0.702	7 19.0	2.46	8.4
32	16 1.4	15 58.7	58 42.56	−0.790	58 32.56	−0.877	8 19.3	2.54	9.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 1.					FRIDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 0 58.72	2.1542	S. 10 4 55.7	15.866	0	14 50 29.82	2.4284	S. 21 20 43.7	11.623
1	13 3 8.10	2.1584	10 20 46.2	15.817	1	14 52 55.72	2.4349	21 32 17.2	11.492
2	13 5 17.73	2.1627	10 36 33.8	15.767	2	14 55 22.01	2.4414	21 43 42.7	11.357
3	13 7 27.62	2.1671	10 52 18.3	15.716	3	14 57 48.69	2.4479	21 55 0.1	11.222
4	13 9 37.78	2.1716	11 7 59.7	15.663	4	15 0 15.76	2.4544	22 6 9.4	11.086
5	13 11 48.21	2.1762	11 23 37.9	15.608	5	15 2 43.22	2.4608	22 17 10.4	10.947
6	13 13 58.92	2.1808	11 39 12.7	15.552	6	15 5 11.05	2.4671	22 28 3.1	10.807
7	13 16 9.91	2.1855	11 54 44.1	15.493	7	15 7 39.27	2.4735	22 38 47.3	10.665
8	13 18 21.18	2.1903	12 10 11.9	15.433	8	15 10 7.87	2.4798	22 49 22.9	10.522
9	13 20 32.74	2.1952	12 25 36.1	15.372	9	15 12 36.85	2.4862	22 59 49.9	10.377
10	13 22 44.60	2.2002	12 40 56.6	15.309	10	15 15 6.21	2.4924	23 10 8.1	10.229
11	13 24 56.76	2.2052	12 56 13.2	15.244	11	15 17 35.94	2.4987	23 20 17.4	10.081
12	13 27 9.22	2.2103	13 11 25.9	15.177	12	15 20 6.05	2.5048	23 30 17.8	9.931
13	13 29 21.99	2.2154	13 26 34.5	15.109	13	15 22 36.52	2.5109	23 40 9.1	9.778
14	13 31 35.07	2.2207	13 41 39.0	15.040	14	15 25 7.36	2.5170	23 49 51.2	9.625
15	13 33 48.47	2.2260	13 56 39.3	14.968	15	15 27 38.56	2.5230	23 59 24.1	9.471
16	13 36 2.19	2.2313	14 11 35.2	14.894	16	15 30 10.12	2.5289	24 8 47.7	9.314
17	13 38 16.23	2.2368	14 26 26.6	14.819	17	15 32 42.03	2.5348	24 18 1.8	9.156
18	13 40 30.61	2.2423	14 41 13.5	14.743	18	15 35 14.29	2.5406	24 27 6.4	8.996
19	13 42 45.31	2.2478	14 55 55.8	14.665	19	15 37 46.90	2.5463	24 36 1.3	8.834
20	13 45 0.35	2.2535	15 10 33.3	14.585	20	15 40 19.85	2.5519	24 44 46.5	8.672
21	13 47 15.73	2.2593	15 25 6.0	14.503	21	15 42 53.13	2.5575	24 53 22.0	8.508
22	13 49 31.46	2.2650	15 39 33.7	14.419	22	15 45 26.75	2.5630	25 1 47.5	8.342
23	13 51 47.53	2.2708	S. 15 53 56.3	14.334	23	15 48 0.69	2.5683	S. 25 10 3.1	8.176
	THURSDAY 2.					SATURDAY 4.			
0	13 54 3.95	2.2767	S. 16 8 13.8	14.247	0	15 50 34.95	2.5737	S. 25 18 8.6	8.007
1	13 56 20.73	2.2826	16 22 25.9	14.157	1	15 53 9.53	2.5789	25 26 4.0	7.837
2	13 58 37.86	2.2885	16 36 32.7	14.067	2	15 55 44.42	2.5840	25 33 49.1	7.666
3	14 0 55.35	2.2946	16 50 34.0	13.975	3	15 58 19.61	2.5889	25 41 23.9	7.493
4	14 3 13.21	2.3007	17 4 29.7	13.881	4	16 0 55.09	2.5938	25 48 48.3	7.320
5	14 5 31.43	2.3068	17 18 19.7	13.785	5	16 3 30.86	2.5985	25 56 2.3	7.145
6	14 7 50.02	2.3129	17 32 3.9	13.687	6	16 6 6.91	2.6032	26 3 5.7	6.968
7	14 10 8.98	2.3191	17 45 42.2	13.587	7	16 8 43.24	2.6078	26 9 58.5	6.791
8	14 12 28.31	2.3253	17 59 14.4	13.486	8	16 11 19.84	2.6122	26 16 40.6	6.612
9	14 14 48.02	2.3317	18 12 40.5	13.383	9	16 13 56.70	2.6164	26 23 12.0	6.433
10	14 17 8.11	2.3380	18 26 0.4	13.278	10	16 16 33.81	2.6205	26 29 32.6	6.252
11	14 19 28.58	2.3443	18 39 13.9	13.172	11	16 19 11.16	2.6245	26 35 42.3	6.070
12	14 21 49.43	2.3507	18 52 21.0	13.063	12	16 21 48.75	2.6284	26 41 41.0	5.887
13	14 24 10.66	2.3571	19 5 21.5	12.953	13	16 24 26.57	2.6322	26 47 28.7	5.703
14	14 26 32.28	2.3635	19 18 15.4	12.842	14	16 27 4.61	2.6357	26 53 5.4	5.518
15	14 28 54.28	2.3690	19 31 2.5	12.728	15	16 29 42.85	2.6391	26 58 30.9	5.332
16	14 31 16.67	2.3764	19 43 42.7	12.612	16	16 32 21.30	2.6424	27 3 45.3	5.147
17	14 33 39.45	2.3829	19 56 15.9	12.494	17	16 34 59.94	2.6455	27 8 48.5	4.959
18	14 36 2.62	2.3894	20 8 42.0	12.375	18	16 37 38.76	2.6485	27 13 40.4	4.770
19	14 38 26.18	2.3959	20 21 0.9	12.254	19	16 40 17.76	2.6513	27 18 20.9	4.581
20	14 40 50.13	2.4023	20 33 12.5	12.132	20	16 42 56.92	2.6539	27 22 50.1	4.392
21	14 43 14.46	2.4089	20 45 16.7	12.007	21	16 45 36.23	2.6564	27 27 7.9	4.201
22	14 45 39.19	2.4154	20 57 13.4	11.881	22	16 48 15.69	2.6588	27 31 14.2	4.009
23	14 48 4.31	2.4219	21 9 2.4	11.752	23	16 50 55.28	2.6609	27 35 9.0	3.818
24	14 50 29.82	2.4284	S. 21 20 43.7	11.623	24	16 53 35.00	2.6629	S. 27 38 52.4	3.627

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 5.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	16 53 35.00	2.6629	S. 27 38 52.4	3.627
1	16 56 14.83	2.6647	27 42 24.2	3.433
2	16 58 54.76	2.6663	27 45 44.4	3.240
3	17 1 34.79	2.6678	27 48 53.0	3.046
4	17 4 14.89	2.6690	27 51 49.9	2.852
5	17 6 55.07	2.6701	27 54 35.2	2.657
6	17 9 35.30	2.6710	27 57 8.8	2.462
7	17 12 15.59	2.6718	27 59 30.7	2.268
8	17 14 55.91	2.6723	28 1 41.0	2.073
9	17 17 36.26	2.6727	28 3 39.5	1.877
10	17 20 16.63	2.6728	28 5 26.3	1.682
11	17 22 57.00	2.6727	28 7 1.4	1.487
12	17 25 37.36	2.6726	28 8 24.8	1.292
13	17 28 17.71	2.6722	28 9 36.4	1.096
14	17 30 58.02	2.6715	28 10 36.3	0.901
15	17 33 38.29	2.6708	28 11 24.5	0.706
16	17 36 18.51	2.6698	28 12 1.0	0.511
17	17 38 58.67	2.6688	28 12 25.8	0.317
18	17 41 38.76	2.6674	28 12 39.0	−0.122
19	17 44 18.76	2.6658	28 12 40.5	+0.072
20	17 46 58.66	2.6641	28 12 30.3	0.267
21	17 49 38.45	2.6623	28 12 8.5	0.460
22	17 52 18.13	2.6602	28 11 35.1	0.653
23	17 54 57.67	2.6579	S. 28 10 50.1	0.846

MONDAY 6.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	17 57 37.08	2.6555	S. 28 9 53.6	1.037
1	18 0 16.33	2.6528	28 8 45.6	1.229
2	18 2 55.42	2.6500	28 7 26.1	1.420
3	18 5 34.33	2.6470	28 5 55.2	1.610
4	18 8 13.06	2.6438	28 4 12.9	1.800
5	18 10 51.59	2.6405	28 2 19.2	1.988
6	18 13 29.92	2.6370	28 0 14.3	2.176
7	18 16 8.03	2.6333	27 57 58.1	2.363
8	18 18 45.92	2.6295	27 55 30.7	2.549
9	18 21 23.57	2.6255	27 52 52.2	2.735
10	18 24 0.98	2.6213	27 50 2.5	2.920
11	18 26 38.13	2.6170	27 47 1.8	3.102
12	18 29 15.02	2.6125	27 43 50.2	3.285
13	18 31 51.63	2.6078	27 40 27.6	3.467
14	18 34 27.95	2.6030	27 36 54.2	3.647
15	18 37 3.99	2.5981	27 33 10.0	3.826
16	18 39 39.72	2.5930	27 29 15.1	4.004
17	18 42 15.15	2.5878	27 25 9.5	4.181
18	18 44 50.26	2.5824	27 20 53.4	4.356
19	18 47 25.04	2.5768	27 16 26.8	4.531
20	18 49 59.48	2.5713	27 11 49.7	4.704
21	18 52 33.59	2.5655	27 7 2.3	4.876
22	18 55 7.34	2.5596	27 2 4.6	5.046
23	18 57 40.74	2.5537	26 56 56.8	5.215
24	19 0 13.78	2.5475	S. 26 51 38.8	5.383

TUESDAY 7.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	19 0 13.78	2.5475	S. 26 51 38.8	5.383
1	19 2 46.44	2.5412	26 46 10.8	5.549
2	19 5 18.72	2.5348	26 40 32.9	5.714
3	19 7 50.62	2.5284	26 34 45.1	5.877
4	19 10 22.13	2.5218	26 28 47.6	6.039
5	19 12 53.24	2.5152	26 22 40.4	6.200
6	19 15 23.95	2.5084	26 16 23.6	6.358
7	19 17 54.25	2.5015	26 9 57.4	6.516
8	19 20 24.13	2.4946	26 3 21.7	6.672
9	19 22 53.60	2.4876	25 56 36.7	6.826
10	19 25 22.64	2.4804	25 49 42.6	6.978
11	19 27 51.25	2.4733	25 42 39.3	7.130
12	19 30 19.43	2.4660	25 35 27.0	7.279
13	19 32 47.17	2.4587	25 28 5.8	7.427
14	19 35 14.47	2.4513	25 20 35.8	7.572
15	19 37 41.32	2.4438	25 12 57.1	7.717
16	19 40 7.72	2.4363	25 5 9.7	7.861
17	19 42 33.67	2.4287	24 57 13.8	8.002
18	19 44 59.16	2.4210	24 49 9.5	8.142
19	19 47 24.19	2.4133	24 40 56.8	8.279
20	19 49 48.76	2.4057	24 32 36.0	8.414
21	19 52 12.87	2.3979	24 24 7.1	8.549
22	19 54 36.51	2.3901	24 15 30.1	8.682
23	19 56 59.68	2.3823	S. 24 6 45.2	8.813

WEDNESDAY 8.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	19 59 22.38	2.3744	S. 23 57 52.5	8.942
1	20 1 44.61	2.3665	23 48 52.1	9.069
2	20 4 6.36	2.3586	23 39 44.2	9.194
3	20 6 27.64	2.3507	23 30 28.8	9.319
4	20 8 48.44	2.3428	23 21 5.9	9.442
5	20 11 8.77	2.3348	23 11 35.8	9.562
6	20 13 28.62	2.3268	23 1 58.5	9.681
7	20 15 47.99	2.3188	22 52 14.1	9.798
8	20 18 6.88	2.3108	22 42 22.7	9.913
9	20 20 25.29	2.3028	22 32 24.5	10.027
10	20 22 43.22	2.2948	22 22 19.5	10.139
11	20 25 0.67	2.2869	22 12 7.8	10.250
12	20 27 17.65	2.2789	22 1 49.5	10.358
13	20 29 34.14	2.2709	21 51 24.8	10.464
14	20 31 50.16	2.2631	21 40 53.8	10.569
15	20 34 5.71	2.2552	21 30 16.5	10.672
16	20 36 20.78	2.2472	21 19 33.1	10.774
17	20 38 35.37	2.2393	21 8 43.6	10.874
18	20 40 49.49	2.2314	20 57 48.2	10.972
19	20 43 3.14	2.2236	20 46 47.0	11.068
20	20 45 16.32	2.2158	20 35 40.0	11.164
21	20 47 29.03	2.2080	20 24 27.3	11.257
22	20 49 41.28	2.2002	20 13 9.1	11.349
23	20 51 53.06	2.1925	20 1 45.4	11.439
24	20 54 4.38	2.1848	S. 19 50 16.4	11.527

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 9.					SATURDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 54 4.38	2.1848	S. 19 50 16.4	11.527	0	22 31 8.94	1.8864	S. 9 23 28.0	14.079
1	20 56 15.24	2.1772	19 38 42.1	11.614	1	22 33 1.99	1.8820	9 9 22.5	14.102
2	20 58 25.64	2.1695	19 27 2.7	11.698	2	22 34 54.78	1.8778	8 55 15.7	14.124
3	21 0 35.58	2.1620	19 15 18.3	11.782	3	22 36 47.32	1.8735	8 41 7.6	14.145
4	21 2 45.08	2.1545	19 3 28.9	11.864	4	22 38 39.60	1.8693	8 26 58.3	14.165
5	21 4 54.12	2.1470	18 51 34.6	11.945	5	22 40 31.64	1.8653	8 12 47.8	14.184
6	21 7 2.72	2.1396	18 39 35.5	12.023	6	22 42 23.43	1.8612	7 58 36.2	14.202
7	21 9 10.87	2.1323	18 27 31.8	12.100	7	22 44 14.98	1.8573	7 44 23.5	14.220
8	21 11 18.59	2.1249	18 15 23.5	12.176	8	22 46 6.31	1.8536	7 30 9.8	14.237
9	21 13 25.86	2.1176	18 3 10.7	12.250	9	22 47 57.41	1.8498	7 15 55.1	14.252
10	21 15 32.70	2.1104	17 50 53.5	12.322	10	22 49 48.29	1.8461	7 1 39.5	14.267
11	21 17 39.11	2.1033	17 38 32.0	12.394	11	22 51 38.94	1.8425	6 47 23.1	14.279
12	21 19 45.09	2.0962	17 26 6.2	12.464	12	22 53 29.39	1.8391	6 33 6.0	14.292
13	21 21 50.65	2.0891	17 13 36.3	12.532	13	22 55 19.63	1.8357	6 18 48.1	14.304
14	21 23 55.78	2.0821	17 1 2.4	12.598	14	22 57 9.67	1.8323	6 4 29.5	14.314
15	21 26 0.50	2.0752	16 48 24.5	12.663	15	22 58 59.51	1.8291	5 50 10.4	14.323
16	21 28 4.80	2.0683	16 35 42.8	12.727	16	23 0 49.16	1.8259	5 35 50.7	14.333
17	21 30 8.69	2.0615	16 22 57.3	12.789	17	23 2 38.62	1.8228	5 21 30.4	14.342
18	21 32 12.18	2.0548	16 10 8.1	12.850	18	23 4 27.89	1.8198	5 7 9.6	14.349
19	21 34 15.26	2.0481	15 57 15.3	12.909	19	23 6 16.99	1.8169	4 52 48.5	14.355
20	21 36 17.95	2.0415	15 44 19.0	12.967	20	23 8 5.92	1.8141	4 38 27.0	14.361
21	21 38 20.24	2.0349	15 31 19.2	13.024	21	23 9 54.68	1.8113	4 24 5.2	14.366
22	21 40 22.14	2.0284	15 18 16.1	13.079	22	23 11 43.27	1.8086	4 9 43.1	14.370
23	21 42 23.65	2.0220	S. 15 5 9.7	13.133	23	23 13 31.71	1.8061	S. 3 55 20.8	14.373
	FRIDAY 10.					SUNDAY 12.			
0	21 44 24.78	2.0158	S. 14 52 0.1	13.186	0	23 15 20.00	1.8036	S. 3 40 58.3	14.376
1	21 46 25.54	2.0095	14 38 47.4	13.237	1	23 17 8.14	1.8011	3 26 35.7	14.377
2	21 48 25.92	2.0033	14 25 31.6	13.287	2	23 18 56.13	1.7988	3 12 13.1	14.377
3	21 50 25.93	1.9972	14 12 12.9	13.336	3	23 20 43.99	1.7965	2 57 50.4	14.377
4	21 52 25.58	1.9912	13 58 51.3	13.383	4	23 22 31.71	1.7943	2 43 27.8	14.377
5	21 54 24.87	1.9852	13 45 26.9	13.429	5	23 24 19.30	1.7923	2 29 5.2	14.375
6	21 56 23.80	1.9793	13 31 59.8	13.473	6	23 26 6.78	1.7903	2 14 42.8	14.372
7	21 58 22.38	1.9734	13 18 30.1	13.517	7	23 27 54.13	1.7882	2 0 20.5	14.369
8	22 0 20.61	1.9677	13 4 57.8	13.560	8	23 29 41.36	1.7863	1 45 58.5	14.365
9	22 2 18.50	1.9620	12 51 22.9	13.602	9	23 31 28.49	1.7846	1 31 36.7	14.361
10	22 4 16.05	1.9564	12 37 45.6	13.641	10	23 33 15.51	1.7829	1 17 15.2	14.355
11	22 6 13.27	1.9509	12 24 6.0	13.679	11	23 35 2.44	1.7813	1 2 54.1	14.349
12	22 8 10.16	1.9455	12 10 24.1	13.717	12	23 36 49.27	1.7798	0 48 33.3	14.342
13	22 10 6.73	1.9402	11 56 40.0	13.753	13	23 38 36.01	1.7783	0 34 13.0	14.334
14	22 12 2.98	1.9348	11 42 53.7	13.788	14	23 40 22.67	1.7770	0 19 53.2	14.326
15	22 13 58.91	1.9296	11 29 5.4	13.822	15	23 42 9.25	1.7757	S. 0 5 33.9	14.317
16	22 15 54.53	1.9245	11 15 15.1	13.855	16	23 43 55.75	1.7744	N. 0 8 44.9	14.307
17	22 17 49.85	1.9195	11 1 22.8	13.887	17	23 45 42.18	1.7733	0 23 3.0	14.297
18	22 19 44.87	1.9145	10 47 28.6	13.918	18	23 47 28.55	1.7723	0 37 20.5	14.286
19	22 21 39.59	1.9096	10 33 32.6	13.947	19	23 49 14.86	1.7713	0 51 37.3	14.273
20	22 23 34.02	1.9048	10 19 34.9	13.976	20	23 51 1.11	1.7704	1 5 53.3	14.261
21	22 25 28.17	1.9001	10 5 35.5	14.003	21	23 52 47.31	1.7696	1 20 8.6	14.248
22	22 27 22.03	1.8954	9 51 34.5	14.029	22	23 54 33.46	1.7688	1 34 23.1	14.234
23	22 29 15.62	1.8909	9 37 32.0	14.054	23	23 56 19.57	1.7682	1 48 36.7	14.219
24	22 31 8.94	1.8864	S. 9 23 28.0	14.079	24	23 58 5.64	1.7676	N. 2 2 49.4	14.203

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 13.					**WEDNESDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 58 5.64	1.7676	N. 2 2 49.4	14.203	0	1 23 44.38	1.8297	N. 12 54 18.4	12.684
1	23 59 51.68	1.7671	2 17 1.1	14.187	1	1 25 34.25	1.8328	13 6 58.0	12.636
2	0 1 37.69	1.7668	2 31 11.9	14.172	2	1 27 24.31	1.8359	13 19 34.7	12.587
3	0 3 23.69	1.7664	2 45 21.7	14.154	3	1 29 14.56	1.8391	13 32 8.4	12.537
4	0 5 9.66	1.7661	2 59 30.4	14.136	4	1 31 5.00	1.8424	13 44 39.1	12.486
5	0 6 55.62	1.7659	3 13 38.0	14.117	5	1 32 55.65	1.8458	13 57 6.7	12.434
6	0 8 41.57	1.7658	3 27 44.4	14.097	6	1 34 46.50	1.8492	14 9 31.2	12.382
7	0 10 27.51	1.7657	3 41 49.7	14.077	7	1 36 37.55	1.8526	14 21 52.6	12.330
8	0 12 13.45	1.7658	3 55 53.7	14.057	8	1 38 28.81	1.8562	14 34 10.8	12.276
9	0 13 59.41	1.7660	4 9 56.5	14.036	9	1 40 20.29	1.8598	14 46 25.7	12.221
10	0 15 45.37	1.7662	4 23 58.0	14.014	10	1 42 11.99	1.8635	14 58 37.3	12.166
11	0 17 31.35	1.7664	4 37 58.2	13.991	11	1 44 3.91	1.8672	15 10 45.6	12.110
12	0 19 17.34	1.7668	4 51 56.9	13.967	12	1 45 56.05	1.8710	15 22 50.5	12.053
13	0 21 3.36	1.7673	5 5 54.2	13.943	13	1 47 48.43	1.8749	15 34 52.0	11.996
14	0 22 49.41	1.7678	5 19 50.1	13.919	14	1 49 41.04	1.8788	15 46 50.0	11.937
15	0 24 35.49	1.7683	5 33 44.5	13.894	15	1 51 33.88	1.8828	15 58 44.5	11.878
16	0 26 21.61	1.7691	5 47 37.4	13.868	16	1 53 26.97	1.8868	16 10 35.4	11.818
17	0 28 7.78	1.7698	6 1 28.7	13.841	17	1 55 20.30	1.8910	16 22 22.7	11.757
18	0 29 53.99	1.7706	6 15 18.3	13.813	18	1 57 13.89	1.8952	16 34 6.3	11.696
19	0 31 40.25	1.7715	6 29 6.3	13.786	19	1 59 7.72	1.8993	16 45 46.2	11.633
20	0 33 26.57	1.7725	6 42 52.6	13.757	20	2 1 1.81	1.9037	16 57 22.3	11.570
21	0 35 12.95	1.7735	6 56 37.2	13.728	21	2 2 56.16	1.9080	17 8 54.6	11.506
22	0 36 59.39	1.7746	7 10 20.0	13.698	22	2 4 50.77	1.9124	17 20 23.0	11.442
23	0 38 45.90	1.7758	N. 7 24 1.0	13.667	23	2 6 45.65	1.9169	N. 17 31 47.6	11.376
	TUESDAY 14.					**THURSDAY 16.**			
0	0 40 32.49	1.7772	N. 7 37 40.1	13.637	0	2 8 40.80	1.9214	N. 17 43 8.1	11.308
1	0 42 19.16	1.7785	7 51 17.4	13.605	1	2 10 36.22	1.9260	17 54 24.6	11.241
2	0 44 5.91	1.7799	8 4 52.7	13.572	2	2 12 31.92	1.9306	18 5 37.0	11.172
3	0 45 52.75	1.7814	8 18 26.0	13.538	3	2 14 27.89	1.9353	18 16 45.3	11.103
4	0 47 39.68	1.7829	8 31 57.3	13.505	4	2 16 24.15	1.9400	18 27 49.4	11.033
5	0 49 26.70	1.7846	8 45 26.6	13.470	5	2 18 20.69	1.9448	18 38 49.3	10.962
6	0 51 13.83	1.7863	8 58 53.7	13.434	6	2 20 17.53	1.9497	18 49 44.9	10.890
7	0 53 1.06	1.7882	9 12 18.7	13.398	7	2 22 14.65	1.9545	19 0 36.1	10.817
8	0 54 48.41	1.7901	9 25 41.6	13.363	8	2 24 12.07	1.9595	19 11 22.9	10.743
9	0 56 35.87	1.7920	9 39 2.3	13.326	9	2 26 9.79	1.9645	19 22 5.3	10.669
10	0 58 23.45	1.7940	9 52 20.7	13.287	10	2 28 7.81	1.9695	19 32 43.2	10.593
11	1 0 11.15	1.7960	10 5 36.8	13.248	11	2 30 6.13	1.9746	19 43 16.5	10.516
12	1 1 58.97	1.7982	10 18 50.5	13.209	12	2 32 4.76	1.9798	19 53 45.1	10.438
13	1 3 46.93	1.8004	10 32 1.9	13.169	13	2 34 3.70	1.9849	20 4 9.1	10.360
14	1 5 35.02	1.8028	10 45 10.8	13.128	14	2 36 2.95	1.9901	20 14 28.3	10.281
15	1 7 23.26	1.8052	10 58 17.3	13.087	15	2 38 2.51	1.9953	20 24 42.8	10.201
16	1 9 11.64	1.8076	11 11 21.3	13.046	16	2 40 2.39	2.0007	20 34 52.4	10.119
17	1 11 0.17	1.8101	11 24 22.8	13.003	17	2 42 2.59	2.0061	20 44 57.1	10.037
18	1 12 48.85	1.8126	11 37 21.7	12.960	18	2 44 3.12	2.0115	20 54 56.8	9.953
19	1 14 37.68	1.8153	11 50 18.0	12.916	19	2 46 3.97	2.0168	21 4 51.5	9.870
20	1 16 26.68	1.8181	12 3 11.6	12.870	20	2 48 5.14	2.0223	21 14 41.2	9.785
21	1 18 15.85	1.8208	12 16 2.4	12.825	21	2 50 6.65	2.0278	21 24 25.7	9.698
22	1 20 5.18	1.8237	12 28 50.5	12.779	22	2 52 8.48	2.0333	21 34 5.0	9.611
23	1 21 54.69	1.8267	12 41 35.9	12.732	23	2 54 10.65	2.0389	21 43 39.0	9.522
24	1 23 44.38	1.8297	N. 12 54 18.4	12.684	24	2 56 13.15	2.0445	N. 21 53 7.7	9.433

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
FRIDAY 17.					SUNDAY 19.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 56 13.15	2.0445	N. 21 53 7.7	9.433	0	4 40 58.43	2.3146	N. 27 23 13.9	3.91
1	2 58 15.99	2.0501	22 2 31.0	9.343	1	4 43 17.45	2.3195	27 27 4.5	3.77
2	3 0 19.16	2.0558	22 11 48.9	9.252	2	4 45 36.77	2.3243	27 30 46.7	3.63
3	3 2 22.68	2.0615	22 21 1.3	9.160	3	4 47 56.36	2.3289	27 34 20.4	3.49
4	3 4 26.54	2.0672	22 30 8.1	9.067	4	4 50 16.24	2.3336	27 37 45.6	3.34
5	3 6 30.74	2.0728	22 39 9.3	8.972	5	4 52 36.39	2.3381	27 41 2.1	3.20
6	3 8 35.28	2.0786	22 48 4.8	8.877	6	4 54 56.81	2.3425	27 44 10.0	3.05
7	3 10 40.17	2.0843	22 56 54.5	8.780	7	4 57 17.49	2.3469	27 47 9.1	2.91
8	3 12 45.40	2.0901	23 5 38.4	8.683	8	4 59 38.44	2.3513	27 49 59.5	2.76
9	3 14 50.98	2.0959	23 14 16.5	8.585	9	5 1 59.64	2.3554	27 52 41.1	2.61
10	3 16 56.91	2.1018	23 22 48.6	8.485	10	5 4 21.09	2.3595	27 55 13.8	2.47
11	3 19 3.19	2.1076	23 31 14.7	8.385	11	5 6 42.78	2.3635	27 57 37.6	2.32
12	3 21 9.82	2.1134	23 39 34.8	8.283	12	5 9 4.71	2.3675	27 59 52.4	2.17
13	3 23 16.80	2.1193	23 47 48.7	8.180	13	5 11 26.88	2.3714	28 1 58.2	2.02
14	3 25 24.13	2.1251	23 55 56.4	8.077	14	5 13 49.28	2.3752	28 3 54.9	1.86
15	3 27 31.81	2.1310	24 3 57.9	7.972	15	5 16 11.90	2.3788	28 5 42.5	1.71
16	3 29 39.85	2.1369	24 11 53.0	7.866	16	5 18 34.73	2.3823	28 7 21.0	1.56
17	3 31 48.24	2.1428	24 19 41.8	7.758	17	5 20 57.77	2.3858	28 8 50.3	1.41
18	3 33 56.98	2.1486	24 27 24.0	7.650	18	5 23 21.03	2.3892	28 10 10.4	1.25
19	3 36 6.07	2.1544	24 34 59.8	7.542	19	5 25 44.48	2.3924	28 11 21.2	1.10
20	3 38 15.51	2.1603	24 42 29.0	7.432	20	5 28 8.12	2.3956	28 12 22.8	0.948
21	3 40 25.30	2.1662	24 49 51.6	7.320	21	5 30 31.95	2.3986	28 13 15.0	0.792
22	3 42 35.45	2.1721	24 57 7.4	7.207	22	5 32 55.95	2.4015	28 13 57.8	0.635
23	3 44 45.95	2.1778	N. 25 4 16.5	7.095	23	5 35 20.13	2.4044	N. 28 14 31.2	0.477
SATURDAY 18.					MONDAY 20.				
0	3 46 56.79	2.1837	N. 25 11 18.8	6.980	0	5 37 44.48	2.4072	N. 28 14 55.1	0.319
1	3 49 7.99	2.1896	25 18 14.1	6.863	1	5 40 8.99	2.4098	28 15 9.5	0.161
2	3 51 19.54	2.1954	25 25 2.4	6.747	2	5 42 33.65	2.4123	28 15 14.5	+0.003
3	3 53 31.44	2.2012	25 31 43.7	6.629	3	5 44 58.46	2.4147	28 15 9.9	−0.157
4	3 55 43.68	2.2069	25 38 17.9	6.510	4	5 47 23.41	2.4168	28 14 55.7	0.317
5	3 57 56.27	2.2127	25 44 44.9	6.390	5	5 49 48.48	2.4190	28 14 31.9	0.477
6	4 0 9.20	2.2183	25 51 4.7	6.269	6	5 52 13.69	2.4211	28 13 58.5	0.637
7	4 2 22.47	2.2240	25 57 17.2	6.147	7	5 54 39.01	2.4230	28 13 15.4	0.798
8	4 4 36.08	2.2298	26 3 22.4	6.024	8	5 57 4.45	2.4248	28 12 22.7	0.959
9	4 6 50.04	2.2354	26 9 20.1	5.900	9	5 59 29.99	2.4265	28 11 20.3	1.121
10	4 9 4.33	2.2410	26 15 10.4	5.775	10	6 1 55.63	2.4281	28 10 8.2	1.282
11	4 11 18.96	2.2466	26 20 53.1	5.649	11	6 4 21.36	2.4296	28 8 46.4	1.445
12	4 13 33.92	2.2521	26 26 28.3	5.522	12	6 6 47.18	2.4309	28 7 14.8	1.608
13	4 15 49.21	2.2576	26 31 55.8	5.393	13	6 9 13.07	2.4321	28 5 33.4	1.771
14	4 18 4.83	2.2630	26 37 15.5	5.263	14	6 11 39.03	2.4332	28 3 42.3	1.934
15	4 20 20.77	2.2684	26 42 27.4	5.133	15	6 14 5.05	2.4341	28 1 41.3	2.097
16	4 22 37.04	2.2738	26 47 31.5	5.002	16	6 16 31.12	2.4349	27 59 30.6	2.260
17	4 24 53.63	2.2792	26 52 27.6	4.869	17	6 18 57.24	2.4357	27 57 10.1	2.424
18	4 27 10.54	2.2844	26 57 15.8	4.736	18	6 21 23.40	2.4363	27 54 39.7	2.587
19	4 29 27.76	2.2896	27 1 55.9	4.601	19	6 23 49.59	2.4367	27 51 59.6	2.751
20	4 31 45.29	2.2947	27 6 27.9	4.466	20	6 26 15.80	2.4370	27 49 9.6	2.915
21	4 34 3.12	2.2998	27 10 51.8	4.330	21	6 28 42.03	2.4373	27 46 9.8	3.078
22	4 36 21.26	2.3048	27 15 7.5	4.192	22	6 31 8.28	2.4375	27 43 0.2	3.242
23	4 38 39.70	2.3098	27 19 14.9	4.053	23	6 33 34.53	2.4374	27 39 40.8	3.405
24	4 40 58.43	2.3146	N. 27 23 13.9	3.913	24	6 36 0.77	2.4373	N. 27 36 11.6	3.569

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 21.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	6 36 0.77	2.4373	N. 27 36 11.6	3.569
1	6 38 27.00	2.4371	27 32 32.5	3.732
2	6 40 53.22	2.4368	27 28 43.7	3.895
3	6 43 19.41	2.4363	27 24 45.1	4.059
4	6 45 45.57	2.4357	27 20 36.6	4.222
5	6 48 11.69	2.4350	27 16 18.4	4.385
6	6 50 37.77	2.4342	27 11 50.4	4.547
7	6 53 3.79	2.4332	27 7 12.7	4.709
8	6 55 29.75	2.4322	27 2 25.3	4.872
9	6 57 55.65	2.4311	26 57 28.1	5.034
10	7 0 21.48	2.4298	26 52 21.2	5.195
11	7 2 47.23	2.4285	26 47 4.7	5.356
12	7 5 12.90	2.4270	26 41 38.5	5.517
13	7 7 38.47	2.4254	26 36 2.7	5.677
14	7 10 3.95	2.4238	26 30 17.3	5.837
15	7 12 29.32	2.4219	26 24 22.3	5.996
16	7 14 54.58	2.4201	26 18 17.8	6.155
17	7 17 19.73	2.4181	26 12 3.7	6.313
18	7 19 44.75	2.4160	26 5 40.2	6.471
19	7 22 9.65	2.4138	25 59 7.2	6.628
20	7 24 34.41	2.4115	25 52 24.8	6.785
21	7 26 59.03	2.4093	25 45 33.0	6.941
22	7 29 23.52	2.4068	25 38 31.9	7.096
23	7 31 47.85	2.4043	N. 25 31 21.5	7.251

WEDNESDAY 22.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	7 34 12.03	2.4017	N. 25 24 1.8	7.405
1	7 36 36.05	2.3990	25 16 32.9	7.557
2	7 38 59.91	2.3963	25 8 54.9	7.710
3	7 41 23.60	2.3934	25 1 7.7	7.862
4	7 43 47.12	2.3905	24 53 11.4	8.012
5	7 46 10.46	2.3875	24 45 6.2	8.162
6	7 48 33.62	2.3844	24 36 52.0	8.312
7	7 50 56.59	2.3813	24 28 28.8	8.461
8	7 53 19.37	2.3780	24 19 56.7	8.608
9	7 55 41.95	2.3748	24 11 15.8	8.754
10	7 58 4.34	2.3715	24 2 26.2	8.899
11	8 0 26.53	2.3681	23 53 27.9	9.044
12	8 2 48.51	2.3646	23 44 20.9	9.188
13	8 5 10.28	2.3611	23 35 5.3	9.331
14	8 7 31.84	2.3575	23 25 41.2	9.472
15	8 9 53.18	2.3539	23 16 8.6	9.613
16	8 12 14.31	2.3503	23 6 27.6	9.752
17	8 14 35.22	2.3466	22 56 38.3	9.891
18	8 16 55.90	2.3428	22 46 40.7	10.029
19	8 19 16.36	2.3391	22 36 34.8	10.166
20	8 21 36.59	2.3353	22 26 20.8	10.301
21	8 23 56.59	2.3314	22 15 58.7	10.435
22	8 26 16.36	2.3275	22 5 28.6	10.567
23	8 28 35.89	2.3236	21 54 50.6	10.700
24	8 30 55.19	2.3197	N. 21 44 4.6	10.832

THURSDAY 23.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	8 30 55.19	2.3197	N. 21 44 4.6	10.832
1	8 33 14.25	2.3157	21 33 10.8	10.961
2	8 35 33.07	2.3117	21 22 9.3	11.088
3	8 37 51.65	2.3078	21 11 0.2	11.216
4	8 40 10.00	2.3038	20 59 43.4	11.342
5	8 42 28.10	2.2997	20 48 19.1	11.467
6	8 44 45.96	2.2956	20 36 47.4	11.590
7	8 47 3.57	2.2915	20 25 8.3	11.714
8	8 49 20.94	2.2874	20 13 21.9	11.833
9	8 51 38.06	2.2833	20 1 28.3	11.953
10	8 53 54.94	2.2793	19 49 27.5	12.072
11	8 56 11.57	2.2752	19 37 19.7	12.188
12	8 58 27.96	2.2711	19 25 4.9	12.304
13	9 0 44.10	2.2670	19 12 43.2	12.418
14	9 3 0.00	2.2629	19 0 14.7	12.531
15	9 5 15.65	2.2588	18 47 39.5	12.642
16	9 7 31.05	2.2547	18 34 57.6	12.753
17	9 9 46.21	2.2507	18 22 9.1	12.862
18	9 12 1.13	2.2467	18 9 14.2	12.969
19	9 14 15.81	2.2427	17 56 12.8	13.076
20	9 16 30.25	2.2386	17 43 5.1	13.180
21	9 18 44.44	2.2346	17 29 51.2	13.283
22	9 20 58.40	2.2307	17 16 31.1	13.386
23	9 23 12.12	2.2267	N. 17 3 4.9	13.487

FRIDAY 24.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	9 25 25.60	2.2228	N. 16 49 32.7	13.585
1	9 27 38.85	2.2188	16 35 54.7	13.682
2	9 29 51.86	2.2149	16 22 10.8	13.779
3	9 32 4.64	2.2111	16 8 21.2	13.874
4	9 34 17.19	2.2073	15 54 25.9	13.967
5	9 36 29.52	2.2036	15 40 25.1	14.059
6	9 38 41.62	2.1998	15 26 18.8	14.150
7	9 40 53.49	2.1960	15 12 7.1	14.239
8	9 43 5.14	2.1924	14 57 50.1	14.327
9	9 45 16.58	2.1888	14 43 27.9	14.412
10	9 47 27.80	2.1852	14 29 0.6	14.497
11	9 49 38.80	2.1817	14 14 28.2	14.581
12	9 51 49.60	2.1783	13 59 50.9	14.662
13	9 54 0.19	2.1748	13 45 8.7	14.742
14	9 56 10.57	2.1713	13 30 21.8	14.821
15	9 58 20.75	2.1680	13 15 30.2	14.898
16	10 0 30.73	2.1647	13 0 34.0	14.974
17	10 2 40.51	2.1614	12 45 33.3	15.048
18	10 4 50.10	2.1583	12 30 28.2	15.121
19	10 6 59.50	2.1551	12 15 18.8	15.192
20	10 9 8.71	2.1520	12 0 5.1	15.263
21	10 11 17.74	2.1490	11 44 47.2	15.332
22	10 13 26.59	2.1460	11 29 25.3	15.397
23	10 15 35.26	2.1431	11 13 59.5	15.462
24	10 17 43.76	2.1403	N. 10 58 29.8	15.527

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 25.					MONDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 17 43.76	2.1403	N. 10 58 29.8	15.527	0	11 58 32.25	2.0907	S. 2 11 34.6	16.813
1	10 19 52.09	2.1374	10 42 56.3	15.588	1	12 0 37.72	2.0917	2 28 23.1	16.803
2	10 22 0.25	2.1348	10 27 19.2	15.649	2	12 2 43.25	2.0928	2 45 11.0	16.792
3	10 24 8.26	2.1321	10 11 38.4	15.709	3	12 4 48.85	2.0939	3 1 58.1	16.778
4	10 26 16.10	2.1294	9 55 54.1	15.767	4	12 6 54.52	2.0952	3 18 44.4	16.764
5	10 28 23.79	2.1269	9 40 6.4	15.822	5	12 9 0.27	2.0966	3 35 29.8	16.748
6	10 30 31.33	2.1245	9 24 15.4	15.877	6	12 11 6.11	2.0980	3 52 14.2	16.731
7	10 32 38.73	2.1221	9 8 21.1	15.931	7	12 13 12.03	2.0995	4 8 57.5	16.712
8	10 34 45.98	2.1198	8 52 23.7	15.982	8	12 15 18.05	2.1012	4 25 39.6	16.690
9	10 36 53.10	2.1175	8 36 23.3	16.032	9	12 17 24.17	2.1028	4 42 20.3	16.667
10	10 39 0.08	2.1153	8 20 19.8	16.082	10	12 19 30.39	2.1046	4 58 59.7	16.644
11	10 41 6.93	2.1132	8 4 13.5	16.128	11	12 21 36.72	2.1065	5 15 37.6	16.619
12	10 43 13.66	2.1112	7 48 4.4	16.174	12	12 23 43.17	2.1085	5 32 14.0	16.592
13	10 45 20.27	2.1092	7 31 52.6	16.218	13	12 25 49.74	2.1105	5 48 48.7	16.563
14	10 47 26.76	2.1073	7 15 38.2	16.261	14	12 27 56.43	2.1126	6 5 21.6	16.534
15	10 49 33.14	2.1055	6 59 21.3	16.302	15	12 30 3.25	2.1148	6 21 52.8	16.503
16	10 51 39.42	2.1038	6 43 2.0	16.342	16	12 32 10.20	2.1171	6 38 22.0	16.469
17	10 53 45.59	2.1020	6 26 40.3	16.380	17	12 34 17.30	2.1195	6 54 49.1	16.435
18	10 55 51.66	2.1004	6 10 16.4	16.417	18	12 36 24.54	2.1220	7 11 14.2	16.399
19	10 57 57.64	2.0990	5 53 50.3	16.452	19	12 38 31.94	2.1246	7 27 37.0	16.362
20	11 0 3.54	2.0975	5 37 22.2	16.485	20	12 40 39.49	2.1272	7 43 57.6	16.323
21	11 2 9.34	2.0961	5 20 52.1	16.517	21	12 42 47.20	2.1299	8 0 15.8	16.282
22	11 4 15.07	2.0948	5 4 20.1	16.548	22	12 44 55.08	2.1328	8 16 31.4	16.239
23	11 6 20.72	2.0936	N. 4 47 46.3	16.577	23	12 47 3.13	2.1357	S. 8 32 44.5	16.197
	SUNDAY 26.					TUESDAY 28.			
0	11 8 26.30	2.0925	N. 4 31 10.8	16.605	0	12 49 11.36	2.1387	S. 8 48 55.0	16.152
1	11 10 31.82	2.0915	4 14 33.7	16.631	1	12 51 19.77	2.1417	9 5 2.7	16.104
2	11 12 37.28	2.0905	3 57 55.1	16.655	2	12 53 28.36	2.1448	9 21 7.5	16.056
3	11 14 42.68	2.0896	3 41 15.1	16.677	3	12 55 37.15	2.1481	9 37 9.4	16.006
4	11 16 48.03	2.0888	3 24 33.8	16.699	4	12 57 46.13	2.1513	9 53 8.2	15.954
5	11 18 53.34	2.0881	3 7 51.2	16.720	5	12 59 55.31	2.1547	10 9 3.9	15.902
6	11 20 58.60	2.0874	2 51 7.4	16.738	6	13 2 4.69	2.1582	10 24 56.4	15.847
7	11 23 3.83	2.0869	2 34 22.6	16.755	7	13 4 14.29	2.1618	10 40 45.6	15.791
8	11 25 9.03	2.0864	2 17 36.8	16.770	8	13 6 24.10	2.1653	10 56 31.3	15.732
9	11 27 14.20	2.0860	2 0 50.2	16.784	9	13 8 34.13	2.1690	11 12 13.5	15.674
10	11 29 19.35	2.0858	1 44 2.7	16.797	10	13 10 44.38	2.1728	11 27 52.2	15.613
11	11 31 24.49	2.0856	1 27 14.5	16.808	11	13 12 54.86	2.1767	11 43 27.1	15.551
12	11 33 29.62	2.0854	1 10 25.7	16.817	12	13 15 5.58	2.1806	11 58 58.3	15.487
13	11 35 34.74	2.0853	0 53 36.4	16.825	13	13 17 16.53	2.1845	12 14 25.6	15.422
14	11 37 39.86	2.0854	0 36 46.7	16.832	14	13 19 27.72	2.1886	12 29 48.9	15.355
15	11 39 44.99	2.0856	0 19 56.6	16.837	15	13 21 39.16	2.1928	12 45 8.2	15.287
16	11 41 50.13	2.0858	N. 0 3 6.3	16.840	16	13 23 50.85	2.1969	13 0 23.3	15.216
17	11 43 55.29	2.0862	S. 0 13 44.2	16.842	17	13 26 2.79	2.2013	13 15 34.1	15.144
18	11 46 0.47	2.0865	0 30 34.8	16.842	18	13 28 15.00	2.2056	13 30 40.6	15.071
19	11 48 5.67	2.0869	0 47 25.3	16.841	19	13 30 27.46	2.2099	13 45 42.6	14.996
20	11 50 10.90	2.0875	1 4 15.7	16.839	20	13 32 40.19	2.2144	14 0 40.1	14.920
21	11 52 16.17	2.0882	1 21 6.0	16.835	21	13 34 53.19	2.2190	14 15 33.0	14.842
22	11 54 21.48	2.0889	1 37 55.9	16.829	22	13 37 6.47	2.2237	14 30 21.1	14.762
23	11 56 26.84	2.0898	1 54 45.5	16.822	23	13 39 20.03	2.2283	14 45 4.4	14.681
24	11 58 32.25	2.0907	S. 2 11 34.6	16.813	24	13 41 33.86	2.2329	S. 14 59 42.8	14.598

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	13 41 33.86	2.2329	S. 14 59 42.8	14.598
1	13 43 47.98	2.2378	15 14 16.2	14.513
2	13 46 2.39	2.2426	15 28 44.4	14.427
3	13 48 17.09	2.2475	15 43 7.4	14.339
4	13 50 32.09	2.2524	15 57 25.1	14.250
5	13 52 47.38	2.2574	16 11 37.4	14.159
6	13 55 2.98	2.2626	16 25 44.2	14.067
7	13 57 18.89	2.2677	16 39 45.4	13.972
8	13 59 35.10	2.2728	16 53 40.9	13.877
9	14 1 51.62	2.2780	17 7 30.7	13.781
10	14 4 8.46	2.2833	17 21 14.6	13.682
11	14 6 25.61	2.2885	17 34 52.5	13.581
12	14 8 43.08	2.2938	17 48 24.3	13.478
13	14 11 0.87	2.2992	18 1 49.9	13.375
14	14 13 18.98	2.3046	18 15 9.3	13.270
15	14 15 37.42	2.3100	18 28 22.3	13.163
16	14 17 56.18	2.3155	18 41 28.9	13.055
17	14 20 15.28	2.3210	18 54 28.9	12.945
18	14 22 34.70	2.3265	19 7 22.3	12.833
19	14 24 54.46	2.3321	19 20 8.9	12.720
20	14 27 14.55	2.3377	19 32 48.7	12.606
21	14 29 34.98	2.3433	19 45 21.6	12.490
22	14 31 55.75	2.3489	19 57 47.5	12.372
23	14 34 16.85	2.3545	S. 20 10 6.2	12.252

THURSDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	14 36 38.29	2.3602	S. 20 22 17.8	12.132
1	14 39 0.07	2.3658	20 34 22.1	12.009
2	14 41 22.19	2.3715	20 46 18.9	11.884
3	14 43 44.65	2.3772	20 58 8.2	11.758
4	14 46 7.45	2.3828	21 9 49.9	11.632
5	14 48 30.59	2.3886	21 21 24.0	11.503
6	14 50 54.08	2.3943	21 32 50.3	11.373
7	14 53 17.90	2.3998	21 44 8.8	11.242
8	14 55 42.06	2.4056	21 55 19.3	11.108
9	14 58 6.57	2.4113	22 6 21.8	10.973
10	15 0 31.41	2.4168	22 17 16.1	10.837
11	15 2 56.59	2.4224	22 28 2.2	10.700
12	15 5 22.10	2.4280	22 38 40.1	10.561
13	15 7 47.95	2.4336	22 49 9.5	10.420
14	15 10 14.13	2.4392	22 59 30.5	10.277
15	15 12 40.65	2.4448	23 9 42.8	10.134
16	15 15 7.50	2.4502	23 19 46.6	9.990
17	15 17 34.67	2.4556	23 29 41.6	9.842
18	15 20 2.17	2.4610	23 39 27.7	9.694
19	15 22 29.99	2.4664	23 49 4.9	9.546
20	15 24 58.14	2.4717	23 58 33.2	9.396
21	15 27 26.60	2.4769	24 7 52.4	9.243
22	15 29 55.37	2.4822	24 17 2.4	9.090
23	15 32 24.46	2.4874	24 26 3.2	8.936
24	15 34 53.86	2.4925	S. 24 34 54.7	8.780

FRIDAY 31.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	15 34 53.86	2.4925	S. 24 34 54.7	8.780
1	15 37 23.56	2.4975	24 43 36.8	8.622
2	15 39 53.56	2.5025	24 52 9.4	8.464
3	15 42 23.86	2.5075	25 0 32.5	8.305
4	15 44 54.46	2.5123	25 8 46.0	8.143
5	15 47 25.34	2.5170	25 16 49.7	7.981
6	15 49 56.50	2.5217	25 24 43.7	7.818
7	15 52 27.94	2.5263	25 32 27.9	7.654
8	15 54 59.66	2.5308	25 40 2.2	7.488
9	15 57 31.64	2.5353	25 47 26.5	7.322
10	16 0 3.89	2.5396	25 54 40.8	7.154
11	16 2 36.39	2.5438	26 1 45.0	6.985
12	16 5 9.14	2.5479	26 8 39.0	6.814
13	16 7 42.14	2.5520	26 15 22.7	6.643
14	16 10 15.38	2.5560	26 21 56.2	6.472
15	16 12 48.86	2.5598	26 28 19.3	6.298
16	16 15 22.56	2.5635	26 34 32.0	6.124
17	16 17 56.48	2.5671	26 40 34.2	5.950
18	16 20 30.61	2.5706	26 46 26.0	5.774
19	16 23 4.95	2.5740	26 52 7.1	5.597
20	16 25 39.49	2.5773	26 57 37.6	5.420
21	16 28 14.22	2.5803	27 2 57.5	5.242
22	16 30 49.13	2.5833	27 8 6.7	5.063
23	16 33 24.22	2.5862	S. 27 13 5.1	4.883

SATURDAY, AUGUST 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	16 35 59.48	2.5889	S. 27 17 52.7	4.702

PHASES OF THE MOON.

			d	h	m
○	Full Moon	July	7	1	59.8
☾	Last Quarter		14	19	31.9
●	New Moon		22	14	38.4
☽	First Quarter		29	11	51.0

			d	h
☾	Perigee	July	2	19.7
☾	Apogee		15	3.1
☾	Perigee		28	0.0

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	8 43 12.80	9.723	N. 18 10 46.6	−37.32	15 47.43	66.67	6 11.64	0.133
SUN.	2	8 47 5.83	9.697	17 55 42.2	38.06	15 47.56	66.58	6 8.11	0.159
Mon.	3	8 50 58.25	9.672	17 40 20.2	38.78	15 47.69	66.49	6 3.98	0.185
Tues.	4	8 54 50.05	9.646	17 24 41.1	−39.49	15 47.83	66.40	5 59.24	0.210
Wed.	5	8 58 41.23	9.620	17 8 45.1	40.18	15 47.97	66.31	5 53.88	0.236
Thur.	6	9 2 31.81	9.595	16 52 32.5	40.87	15 48.11	66.22	5 47.92	0.261
Frid.	7	9 6 21.80	9.570	16 36 3.5	−41.54	15 48.25	66.13	5 41.37	0.285
Sat.	8	9 10 11.20	9.546	16 19 18.4	42.20	15 48.40	66.05	5 34.23	0.309
SUN.	9	9 14 0.01	9.522	16 2 17.5	42.86	15 48.54	65.96	5 26.51	0.333
Mon.	10	9 17 48.26	9.498	15 45 1.1	−43.50	15 48.69	65.88	5 18.23	0.357
Tues.	11	9 21 35.95	9.475	15 27 29.5	44.13	15 48.84	65.79	5 9.39	0.380
Wed.	12	9 25 23.08	9.452	15 9 42.9	44.74	15 49.00	65.71	4 59.98	0.403
Thur.	13	9 29 9.66	9.429	14 51 41.7	−45.35	15 49.16	65.63	4 50.03	0.426
Frid.	14	9 32 55.70	9.407	14 33 26.2	45.94	15 49.33	65.55	4 39.54	0.448
Sat.	15	9 36 41.21	9.385	14 14 56.7	46.52	15 49.50	65.47	4 28.53	0.470
SUN.	16	9 40 26.20	9.364	13 56 13.5	−47.08	15 49.67	65.40	4 17.00	0.491
Mon.	17	9 44 10.68	9.343	13 37 16.9	47.63	15 49.84	65.32	4 4.96	0.512
Tues.	18	9 47 54.65	9.322	13 18 7.1	48.17	15 50.02	65.25	3 52.41	0.533
Wed.	19	9 51 38.12	9.301	12 58 44.6	−48.69	15 50.20	65.18	3 39.36	0.554
Thur.	20	9 55 21.11	9.281	12 39 9.7	49.20	15 50.39	65.11	3 25.83	0.574
Frid.	21	9 59 3.62	9.261	12 19 22.7	49.70	15 50.58	65.04	3 11.83	0.594
Sat.	22	10 2 45.66	9.242	11 59 24.0	−50.18	15 50.78	64.97	2 57.35	0.613
SUN.	23	10 6 27.24	9.223	11 39 14.0	50.65	15 50.98	64.90	2 42.40	0.632
Mon.	24	10 10 8.36	9.204	11 18 52.9	51.10	15 51.19	64.84	2 27.01	0.651
Tues.	25	10 13 49.03	9.186	10 58 21.1	−51.54	15 51.40	64.78	2 11.18	0.669
Wed.	26	10 17 29.27	9.168	10 37 39.0	51.96	15 51.62	64.72	1 54.91	0.687
Thur.	27	10 21 9.09	9.151	10 16 46.9	52.37	15 51.84	64.66	1 38.21	0.704
Frid.	28	10 24 48.51	9.134	9 55 45.2	−52.77	15 52.06	64.60	1 21.12	0.720
Sat.	29	10 28 27.53	9.118	9 34 34.1	53.15	15 52.28	64.55	1 3.64	0.736
SUN.	30	10 32 6.17	9.103	9 13 14.1	53.52	15 52.51	64.50	0 45.78	0.751
Mon.	31	10 35 44.46	9.088	8 51 45.4	53.87	15 52.73	64.45	0 27.56	0.766
Tues.	32	10 39 22.41	9.075	N. 8 30 8.3	−54.22	15 52.96	64.40	0 9.01	0.780

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting 0ˢ.18 from the sidereal time. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	8 43 11.80	9.723	N.18 10 50.4	−37.31	6 11.65	0.133	8 37 0.16
SUN.	2	8 47 4.84	9.697	17 55 46.0	38.05	6 8.13	0.159	8 40 56.71
Mon.	3	8 50 57.27	9.672	17 40 24.1	38.77	6 4.00	0.185	8 44 53.27
Tues.	4	8 54 49.08	9.646	17 24 45.0	−39.48	5 59.26	0.210	8 48 49.82
Wed.	5	8 58 40.28	9.621	17 8 49.0	40.18	5 53.91	0.236	8 52 46.38
Thur.	6	9 2 30.88	9.596	16 52 36.4	40.87	5 47.95	0.261	8 56 42.94
Frid.	7	9 6 20.89	9.571	16 36 7.4	−41.54	5 41.40	0.285	9 0 39.50
Sat.	8	9 10 10.31	9.547	16 19 22.3	42.20	5 34.26	0.309	9 4 36.05
SUN.	9	9 13 59.15	9.523	16 2 21.4	42.86	5 26.54	0.333	9 8 32.61
Mon.	10	9 17 47.42	9.499	15 45 4.9	−43.50	5 18.26	0.357	9 12 29.16
Tues.	11	9 21 35.13	9.476	15 27 33.3	44.13	5 9.42	0.380	9 16 25.72
Wed.	12	9 25 22.29	9.453	15 9 46.7	44.74	5 0.02	0.403	9 20 22.28
Thur.	13	9 29 8.90	9.431	14 51 45.4	−45.35	4 50.07	0.426	9 24 18.83
Frid.	14	9 32 54.97	9.409	14 33 29.8	45.94	4 39.58	0.448	9 28 15.38
Sat.	15	9 36 40.51	9.387	14 15 0.2	46.52	4 28.57	0.470	9 32 11.94
SUN.	16	9 40 25.53	9.365	13 56 16.9	−47.09	4 17.04	0.491	9 36 8.50
Mon.	17	9 44 10.04	9.344	13 37 20.1	47.64	4 4.99	0.512	9 40 5.05
Tues.	18	9 47 54.05	9.323	13 18 10.2	48.18	3 52.44	0.533	9 44 1.61
Wed.	19	9 51 37.56	9.303	12 58 47.5	−48.70	3 39.40	0.554	9 47 58.16
Thur.	20	9 55 20.58	9.283	12 39 12.5	49.21	3 25.87	0.574	9 51 54.72
Frid.	21	9 59 3.12	9.263	12 19 25.4	49.71	3 11.86	0.594	9 55 51.27
Sat.	22	10 2 45.20	9.243	11 59 26.5	−50.19	2 57.38	0.613	9 59 47.83
SUN.	23	10 6 26.82	9.224	11 39 16.3	50.66	2 42.44	0.632	10 3 44.38
Mon.	24	10 10 7.98	9.205	11 18 55.0	51.11	2 27.04	0.651	10 7 40.94
Tues.	25	10 13 48.69	9.187	10 58 23.0	−51.55	2 11.20	0.669	10 11 37.49
Wed.	26	10 17 28.97	9.170	10 37 40.7	51.97	1 54.93	0.687	10 15 34.05
Thur.	27	10 21 8.84	9.153	10 16 48.4	52.38	1 38.24	0.704	10 19 30.60
Frid.	28	10 24 48.30	9.136	9 55 46.4	−52.78	1 21.14	0.720	10 23 27.16
Sat.	29	10 28 27.37	9.120	9 34 35.1	53.16	1 3.65	0.736	10 27 23.71
SUN.	30	10 32 6.06	9.105	9 13 14.8	53.53	0 45.79	0.751	10 31 20.27
Mon.	31	10 35 44.39	9.090	8 51 45.8	53.88	0 27.57	0.766	10 35 16.82
Tues.	32	10 39 22.39	9.077	N. 8 30 8.4	−54.23	0 9.02	0.780	10 39 13.38

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
+9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	λ′	Diff. for 1 Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	213	128 22 46.0	22 9.1	143.50	−0.47	0.006 3992	−24.3	15 20 28.63
2	214	129 20 10.4	19 33.3	143.53	0.45	0.006 3402	24.9	15 16 32.72
3	215	130 17 35.4	16 58.2	143.56	0.41	0.006 2798	25.4	15 12 36.81
4	216	131 15 1.3	14 23.9	143.59	−0.33	0.006 2182	−25.9	15 8 40.90
5	217	132 12 28.0	11 50.5	143.63	0.22	0.006 1553	26.4	15 4 44.99
6	218	133 9 55.7	9 18.0	143.68	−0.09	0.006 0913	26.9	15 0 49.08
7	219	134 7 24.4	6 46.6	143.73	+0.04	0.006 0261	−27.4	14 56 53.17
8	220	135 4 54.3	4 16.3	143.77	0.16	0.005 9597	27.9	14 52 57.26
9	221	136 2 25.4	1 47.3	143.82	0.28	0.005 8920	28.5	14 49 1.35
10	222	136 59 57.8	59 19.6	143.87	+0.39	0.005 8231	−29.0	14 45 5.44
11	223	137 57 31.6	56 53.2	143.93	0.50	0.005 7528	29.6	14 41 9.53
12	224	138 55 6.7	54 28.2	143.99	0.57	0.005 6811	30.2	14 37 13.62
13	225	139 52 43.3	52 4.6	144.05	+0.63	0.005 6078	−30.8	14 33 17.71
14	226	140 50 21.4	49 42.5	144.11	0.67	0.005 5330	31.5	14 29 21.80
15	227	141 48 0.9	47 21.9	144.18	0.66	0.005 4566	32.2	14 25 25.89
16	228	142 45 42.0	45 2.9	144.24	+0.63	0.005 3784	−32.9	14 21 29.98
17	229	143 43 24.6	42 45.3	144.31	0.58	0.005 2984	33.7	14 17 34.07
18	230	144 41 8.8	40 29.4	144.37	0.49	0.005 2165	34.5	14 13 38.16
19	231	145 38 54.5	38 14.9	144.44	+0.39	0.005 1326	−35.4	14 9 42.25
20	232	146 36 41.7	36 2.0	144.50	0.26	0.005 0466	36.3	14 5 46.34
21	233	147 34 30.4	33 50.5	144.56	+0.12	0.004 9586	37.3	14 1 50.43
22	234	148 32 20.5	31 40.5	144.62	−0.03	0.004 8685	−38.1	13 57 54.52
23	235	149 30 11.9	29 31.9	144.67	0.17	0.004 7762	38.8	13 53 58.62
24	236	150 28 4.7	27 24.5	144.73	0.29	0.004 6820	39.5	13 50 2.71
25	237	151 25 58.8	25 18.5	144.78	−0.41	0.004 5859	−40.2	13 46 6.80
26	238	152 23 54.2	23 13.7	144.83	0.49	0.004 4881	41.0	13 42 10.89
27	239	153 21 50.7	21 10.1	144.88	0.54	0.004 3886	41.7	13 38 14.98
28	240	154 19 48.6	19 7.8	144.94	−0.57	0.004 2878	−42.3	13 34 19.07
29	241	155 17 47.6	17 6.8	145.00	0.55	0.004 1857	42.8	13 30 23.16
30	242	156 15 48.0	15 7.1	145.05	0.51	0.004 0825	43.2	13 26 27.25
31	243	157 13 49.8	13 8.7	145.10	0.44	0.003 9784	43.5	13 22 31.34
32	244	158 11 53.0	11 11.8	145.16	−0.34	0.003 8735	−43.9	13 18 35.44

Note.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fititious year.

Diff. for 1 Hour,
−9s.8296.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 1.4	15 58.7	58 42.56	−0.790	58 32.56	−0.877	8 19.3	2.54	9.4
2	15 55.7	15 52.4	58 21.51	0.964	58 9.44	1.049	9 20.4	2.53	10.4
3	15 48.8	15 45.0	57 56.36	1.130	57 42.34	1.206	10 19.9	2.42	11.4
4	15 40.9	15 36.7	57 27.46	−1.273	57 11.83	−1.329	11 15.8	2.24	12.4
5	15 32.3	15 27.8	56 55.61	1.371	56 38.98	1.398	12 7.2	2.05	13.4
6	15 23.2	15 18.6	56 22.13	1.406	56 5.31	1.394	12 54.2	1.88	14.4
7	15 14.1	15 9.7	55 48.76	−1.361	55 32.74	−1.306	13 37.8	1.76	15.4
8	15 5.5	15 1.7	55 17.51	1.229	55 3.32	1.131	14 19.0	1.68	16.4
9	14 58.2	14 55.1	54 50.44	1.012	54 39.10	0.874	14 59.0	1.66	17.4
10	14 52.5	14 50.4	54 29.53	−0.719	54 21.92	−0.548	15 38.9	1.68	18.4
11	14 48.9	14 48.0	54 16.44	−0.363	54 13.25	−0.166	16 19.9	1.74	19.4
12	14 47.8	14 48.3	54 12.48	+0.039	54 14.21	+0.250	17 2.9	1.85	20.4
13	14 49.4	14 51.3	54 18.50	+0.465	54 25.38	+0.680	17 48.8	1.98	21.4
14	14 53.9	14 57.2	54 34.81	0.891	54 46.74	1.097	18 38.1	2.12	22.4
15	15 1.1	15 5.6	55 1.10	1.293	55 17.71	1.472	19 30.7	2.25	23.4
16	15 10.7	15 16.2	55 36.36	+1.633	55 56.82	+1.772	20 25.9	2.33	24.4
17	15 22.2	15 28.5	56 18.79	1.884	56 41.90	1.963	21 22.2	2.34	25.4
18	15 35.0	15 41.6	57 5.75	2.006	57 29.88	2.010	22 17.8	2.29	26.4
19	15 48.1	15 54.5	57 53.82	+1.973	58 17.06	+1.893	23 11.7	2.20	27.4
20	16 0.5	16 6.0	58 39.08	1.771	58 59.40	1.610	6	. .	28.4
21	16 10.9	16 15.2	59 17.57	1.413	59 33.20	1.186	0 3.5	2.12	0.0
22	16 18.7	16 21.3	59 45.95	+0.937	59 55.63	+0.674	0 53.5	2.06	1.0
23	16 23.1	16 24.0	60 2.10	+0.405	60 5.37	+0.140	1 42.7	2.05	2.0
24	16 24.0	16 23.2	60 5.50	−0.114	60 2.69	−0.350	2 32.2	2.09	3.0
25	16 21.7	16 19.6	59 57.20	−0.562	59 49.31	−0.747	3 23.3	2.18	4.0
26	16 16.9	16 13.7	59 39.38	0.903	59 27.74	1.032	4 17.1	2.31	5.0
27	16 10.2	16 6.3	59 14.72	1.133	59 0.64	1.209	5 14.0	2.43	6.0
28	16 2.3	15 58.1	58 45.79	−1.263	58 30.41	−1.298	6 13.5	2.51	7.0
29	15 53.8	15 49.5	58 14.71	1.317	57 58.85	1.324	7 14.1	2.51	8.0
30	15 45.2	15 40.8	57 42.96	1.324	57 27.10	1.318	8 13.5	2.42	9.0
31	15 36.6	15 32.3	57 11.35	1.305	56 55.79	1.288	9 9.7	2.26	10.0
32	15 28.1	15 24.0	56 40.45	−1.269	56 25.34	−1.249	10 1.7	2.08	11.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	16 35 59.48	2.5889	S. 27 17 52.7	4.702
1	16 38 34.89	2.5915	27 22 29.4	4.522
2	16 41 10.46	2.5940	27 26 55.3	4.341
3	16 43 46.17	2.5963	27 31 10.3	4.158
4	16 46 22.02	2.5985	27 35 14.3	3.975
5	16 48 57.99	2.6005	27 39 7.3	3.792
6	16 51 34.08	2.6024	27 42 49.3	3.608
7	16 54 10.28	2.6043	27 46 20.3	3.424
8	16 56 46.59	2.6058	27 49 40.2	3.239
9	16 59 22.98	2.6072	27 52 49.0	3.054
10	17 1 59.45	2.6085	27 55 46.7	2.869
11	17 4 36.00	2.6097	27 58 33.3	2.683
12	17 7 12.61	2.6106	28 1 8.7	2.497
13	17 9 49.27	2.6114	28 3 32.9	2.310
14	17 12 25.98	2.6122	28 5 45.9	2.124
15	17 15 2.73	2.6127	28 7 47.8	1.937
16	17 17 39.50	2.6129	28 9 38.4	1.750
17	17 20 16.28	2.6131	28 11 17.8	1.564
18	17 22 53.07	2.6132	28 12 46.1	1.377
19	17 25 29.86	2.6130	28 14 3.1	1.190
20	17 28 6.63	2.6128	28 15 8.9	1.002
21	17 30 43.39	2.6123	28 16 3.4	0.815
22	17 33 20.11	2.6117	28 16 46.7	0.629
23	17 35 56.79	2.6108	S. 28 17 18.9	0.442

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	17 38 33.41	2.6098	S. 28 17 39.8	0.256
1	17 41 9.97	2.6088	28 17 49.6	−0.070
2	17 43 46.46	2.6075	28 17 48.2	+0.116
3	17 46 22.87	2.6060	28 17 35.7	0.302
4	17 48 59.18	2.6044	28 17 12.0	0.487
5	17 51 35.40	2.6027	28 16 37.2	0.672
6	17 54 11.50	2.6007	28 15 51.3	0.857
7	17 56 47.48	2.5987	28 14 54.4	1.040
8	17 59 23.34	2.5965	28 13 46.5	1.224
9	18 1 59.06	2.5941	28 12 27.5	1.407
10	18 4 34.63	2.5915	28 10 57.6	1.589
11	18 7 10.04	2.5888	28 9 16.8	1.772
12	18 9 45.28	2.5859	28 7 25.0	1.953
13	18 12 20.35	2.5829	28 5 22.4	2.134
14	18 14 55.23	2.5797	28 3 8.9	2.315
15	18 17 29.91	2.5763	28 0 44.6	2.494
16	18 20 4.39	2.5729	27 58 9.6	2.672
17	18 22 38.66	2.5693	27 55 24.0	2.849
18	18 25 12.71	2.5656	27 52 27.7	3.027
19	18 27 46.53	2.5617	27 49 20.8	3.203
20	18 30 20.11	2.5577	27 46 3.3	3.378
21	18 32 53.45	2.5535	27 42 35.4	3.552
22	18 35 26.53	2.5492	27 38 57.0	3.726
23	18 37 59.35	2.5448	27 35 8.3	3.897
24	18 40 31.91	2.5403	S. 27 31 9.3	4.069

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min
	h m s	s	° ′ ″	″
0	18 40 31.91	2.5403	S. 27 31 9.3	4.06
1	18 43 4.18	2.5355	27 27 0.0	4.24
2	18 45 36.17	2.5308	27 22 40.5	4.40
3	18 48 7.87	2.5258	27 18 10.9	4.57
4	18 50 39.26	2.5208	27 13 31.3	4.74
5	18 53 10.36	2.5157	27 8 41.7	4.91
6	18 55 41.14	2.5103	27 3 42.1	5.07
7	18 58 11.60	2.5049	26 58 32.7	5.23
8	19 0 41.73	2.4994	26 53 13.5	5.40
9	19 3 11.53	2.4938	26 47 44.6	5.56
10	19 5 40.99	2.4883	26 42 6.1	5.72
11	19 8 10.12	2.4825	26 36 18.0	5.88
12	19 10 38.89	2.4765	26 30 20.4	6.03
13	19 13 7.30	2.4705	26 24 13.4	6.19
14	19 15 35.35	2.4645	26 17 57.1	6.34
15	19 18 3.04	2.4584	26 11 31.6	6.501
16	19 20 30.36	2.4522	26 4 57.0	6.65
17	19 22 57.30	2.4458	25 58 13.3	6.804
18	19 25 23.86	2.4395	25 51 20.5	6.953
19	19 27 50.04	2.4331	25 44 18.9	7.100
20	19 30 15.83	2.4266	25 37 8.5	7.247
21	19 32 41.23	2.4200	25 29 49.3	7.392
22	19 35 6.23	2.4133	25 22 21.5	7.535
23	19 37 30.83	2.4067	S. 25 14 45.1	7.677

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min
0	19 39 55.03	2.3999	S. 25 7 0.2	7.818
1	19 42 18.82	2.3931	24 59 6.9	7.957
2	19 44 42.20	2.3863	24 51 5.4	8.093
3	19 47 5.17	2.3793	24 42 55.7	8.229
4	19 49 27.72	2.3723	24 34 37.9	8.364
5	19 51 49.85	2.3654	24 26 12.0	8.497
6	19 54 11.57	2.3584	24 17 38.2	8.628
7	19 56 32.86	2.3513	24 8 56.6	8.757
8	19 58 53.73	2.3443	24 0 7.3	8.886
9	20 1 14.17	2.3371	23 51 10.3	9.012
10	20 3 34.18	2.3300	23 42 5.8	9.137
11	20 5 53.77	2.3228	23 32 53.8	9.261
12	20 8 12.92	2.3156	23 23 34.5	9.382
13	20 10 31.64	2.3084	23 14 7.9	9.503
14	20 12 49.93	2.3013	23 4 34.1	9.622
15	20 15 7.79	2.2940	22 54 53.3	9.738
16	20 17 25.21	2.2868	22 45 5.5	9.854
17	20 19 42.20	2.2796	22 35 10.8	9.968
18	20 21 58.76	2.2723	22 25 9.3	10.081
19	20 24 14.88	2.2651	22 15 1.1	10.192
20	20 26 30.57	2.2578	22 4 46.3	10.301
21	20 28 45.81	2.2505	21 54 25.0	10.409
22	20 31 0.63	2.2433	21 43 57.2	10.515
23	20 33 15.01	2.2361	21 33 23.2	10.619
24	20 35 28.96	2.2289	S. 21 22 42.9	10.722

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 5.					**FRIDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 35 28.96	2.2289	S. 21 22 42.9	10.722	0	22 14 49.91	1.9306	S. 11 18 3.2	13.932
1	20 37 42.48	2.2218	21 11 56.5	10.823	1	22 16 45.60	1.9258	11 4 6.2	13.967
2	20 39 55.57	2.2146	21 1 4.1	10.923	2	22 18 41.00	1.9210	10 50 7.1	14.001
3	20 42 8.23	2.2074	20 50 5.7	11.022	3	22 20 36.12	1.9164	10 36 6.1	14.032
4	20 44 20.46	2.2003	20 39 1.5	11.118	4	22 22 30.97	1.9119	10 22 3.2	14.063
5	20 46 32.26	2.1932	20 27 51.5	11.213	5	22 24 25.55	1.9074	10 7 58.5	14.093
6	20 48 43.64	2.1861	20 16 35.9	11.307	6	22 26 19.86	1.9030	9 53 52.0	14.122
7	20 50 54.59	2.1790	20 5 14.7	11.398	7	22 28 13.91	1.8988	9 39 43.8	14.150
8	20 53 5.12	2.1720	19 53 48.1	11.488	8	22 30 7.71	1.8945	9 25 34.0	14.177
9	20 55 15.23	2.1650	19 42 16.1	11.578	9	22 32 1.25	1.8903	9 11 22.6	14.202
10	20 57 24.92	2.1580	19 30 38.7	11.667	10	22 33 54.55	1.8863	8 57 9.7	14.227
11	20 59 34.19	2.1511	19 18 56.1	11.752	11	22 35 47.60	1.8822	8 42 55.4	14.250
12	21 1 43.05	2.1442	19 7 8.5	11.835	12	22 37 40.41	1.8783	8 28 39.7	14.272
13	21 3 51.49	2.1373	18 55 15.9	11.918	13	22 39 32.99	1.8744	8 14 22.7	14.294
14	21 5 59.52	2.1304	18 43 18.3	12.000	14	22 41 25.34	1.8706	8 0 4.4	14.315
15	21 8 7.14	2.1237	18 31 15.9	12.079	15	22 43 17.46	1.8668	7 45 44.9	14.334
16	21 10 14.36	2.1170	18 19 8.8	12.157	16	22 45 9.36	1.8632	7 31 24.3	14.352
17	21 12 21.18	2.1103	18 6 57.0	12.235	17	22 47 1.04	1.8596	7 17 2.7	14.368
18	21 14 27.59	2.1036	17 54 40.6	12.310	18	22 48 52.51	1.8562	7 2 40.1	14.385
19	21 16 33.61	2.0970	17 42 19.8	12.383	19	22 50 43.78	1.8528	6 48 16.5	14.400
20	21 18 39.23	2.0904	17 29 54.6	12.457	20	22 52 34.84	1.8493	6 33 52.1	14.414
21	21 20 44.46	2.0839	17 17 25.0	12.528	21	22 54 25.70	1.8461	6 19 26.8	14.428
22	21 22 49.30	2.0775	17 4 51.2	12.597	22	22 56 16.37	1.8429	6 5 0.7	14.440
23	21 24 53.76	2.0711	S. 16 52 13.3	12.665	23	22 58 6.85	1.8398	S. 5 50 34.0	14.451
	THURSDAY 6.					**SATURDAY 8.**			
0	21 26 57.83	2.0647	S. 16 39 31.4	12.732	0	22 59 57.15	1.8368	S. 5 36 6.6	14.462
1	21 29 1.52	2.0584	16 26 45.5	12.797	1	23 1 47.26	1.8338	5 21 38.6	14.471
2	21 31 4.84	2.0522	16 13 55.7	12.861	2	23 3 37.20	1.8308	5 7 10.1	14.479
3	21 33 7.78	2.0460	16 1 2.2	12.923	3	23 5 26.96	1.8280	4 52 41.1	14.487
4	21 35 10.36	2.0399	15 48 4.9	12.985	4	23 7 16.56	1.8253	4 38 11.7	14.493
5	21 37 12.57	2.0338	15 35 4.0	13.044	5	23 9 6.00	1.8227	4 23 41.9	14.499
6	21 39 14.41	2.0278	15 21 59.6	13.102	6	23 10 55.28	1.8200	4 9 11.8	14.504
7	21 41 15.90	2.0218	15 8 51.7	13.160	7	23 12 44.40	1.8175	3 54 41.4	14.508
8	21 43 17.03	2.0159	14 55 40.4	13.216	8	23 14 33.38	1.8151	3 40 10.8	14.511
9	21 45 17.81	2.0101	14 42 25.8	13.270	9	23 16 22.21	1.8127	3 25 40.1	14.512
10	21 47 18.24	2.0043	14 29 8.0	13.323	10	23 18 10.90	1.8104	3 11 9.3	14.514
11	21 49 18.33	1.9986	14 15 47.0	13.375	11	23 19 59.46	1.8083	2 56 38.4	14.515
12	21 51 18.07	1.9929	14 2 23.0	13.425	12	23 21 47.89	1.8061	2 42 7.5	14.514
13	21 53 17.48	1.9874	13 48 56.0	13.474	13	23 23 36.19	1.8040	2 27 36.7	14.512
14	21 55 16.56	1.9818	13 35 26.1	13.522	14	23 25 24.37	1.8020	2 13 6.0	14.511
15	21 57 15.30	1.9763	13 21 53.3	13.569	15	23 27 12.43	1.8001	1 58 35.4	14.508
16	21 59 13.72	1.9710	13 8 17.8	13.615	16	23 29 0.38	1.7983	1 44 5.0	14.504
17	22 1 11.82	1.9658	12 54 39.5	13.659	17	23 30 48.23	1.7965	1 29 34.9	14.499
18	22 3 9.61	1.9605	12 40 58.7	13.701	18	23 32 35.96	1.7948	1 15 5.1	14.494
19	22 5 7.08	1.9553	12 27 15.4	13.742	19	23 34 23.60	1.7933	1 0 35.6	14.488
20	22 7 4.25	1.9503	12 13 29.6	13.783	20	23 36 11.15	1.7918	0 46 6.5	14.481
21	22 9 1.11	1.9452	11 59 41.4	13.822	21	23 37 58.61	1.7903	0 31 37.9	14.472
22	22 10 57.67	1.9402	11 45 50.9	13.861	22	23 39 45.98	1.7888	0 17 9.8	14.464
23	22 12 53.93	1.9353	11 31 58.1	13.897	23	23 41 33.27	1.7876	S. 0 2 42.2	14.454
24	22 14 49.91	1.9306	S. 11 18 3.2	13.932	24	23 43 20.49	1.7863	N. 0 11 44.7	14.443

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 9.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	23 43 20.49	1.7863	N. 0 11 44.7	14.443
1	23 45 7.63	1.7851	0 26 11.0	14.432
2	23 46 54.70	1.7841	0 40 36.6	14.421
3	23 48 41.72	1.7831	0 55 1.5	14.408
4	23 50 28.67	1.7821	1 9 25.6	14.395
5	23 52 15.57	1.7813	1 23 48.9	14.381
6	23 54 2.42	1.7804	1 38 11.3	14.366
7	23 55 49.22	1.7797	1 52 32.8	14.350
8	23 57 35.98	1.7791	2 6 53.3	14.333
9	23 59 22.71	1.7785	2 21 12.8	14.317
10	0 1 9.40	1.7780	2 35 31.3	14.299
11	0 2 56.07	1.7777	2 49 48.7	14.280
12	0 4 42.72	1.7773	3 4 4.9	14.261
13	0 6 29.35	1.7770	3 18 20.0	14.241
14	0 8 15.96	1.7768	3 32 33.8	14.219
15	0 10 2.56	1.7767	3 46 46.3	14.197
16	0 11 49.16	1.7766	4 0 57.5	14.176
17	0 13 35.75	1.7766	4 15 7.4	14.153
18	0 15 22.35	1.7768	4 29 15.9	14.129
19	0 17 8.96	1.7769	4 43 22.9	14.104
20	0 18 55.58	1.7772	4 57 28.4	14.079
21	0 20 42.22	1.7774	5 11 32.4	14.053
22	0 22 28.87	1.7778	5 25 34.8	14.027
23	0 24 15.55	1.7783	N. 5 39 35.7	14.000

MONDAY 10.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	0 26 2.26	1.7788	N. 5 53 34.8	13.971
1	0 27 49.01	1.7794	6 7 32.2	13.942
2	0 29 35.79	1.7800	6 21 27.9	13.913
3	0 31 22.61	1.7808	6 35 21.8	13.883
4	0 33 9.48	1.7816	6 49 13.9	13.852
5	0 34 56.40	1.7825	7 3 4.1	13.821
6	0 36 43.38	1.7834	7 16 52.4	13.789
7	0 38 30.41	1.7844	7 30 38.8	13.757
8	0 40 17.51	1.7856	7 44 23.2	13.722
9	0 42 4.68	1.7868	7 58 5.5	13.687
10	0 43 51.92	1.7879	8 11 45.7	13.652
11	0 45 39.23	1.7892	8 25 23.8	13.617
12	0 47 26.62	1.7906	8 38 59.8	13.581
13	0 49 14.10	1.7921	8 52 33.5	13.543
14	0 51 1.67	1.7936	9 6 5.0	13.506
15	0 52 49.33	1.7951	9 19 34.2	13.467
16	0 54 37.08	1.7968	9 33 1.1	13.428
17	0 56 24.94	1.7985	9 46 25.6	13.388
18	0 58 12.90	1.8003	9 59 47.7	13.347
19	1 0 0.98	1.8023	10 13 7.3	13.307
20	1 1 49.17	1.8041	10 26 24.5	13.265
21	1 3 37.47	1.8061	10 39 39.1	13.222
22	1 5 25.90	1.8082	10 52 51.1	13.178
23	1 7 14.45	1.8103	11 6 0.5	13.134
24	1 9 3.13	1.8125	N. 11 19 7.2	13.089

TUESDAY 11.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	1 9 3.13	1.8125	N. 11 19 7.2	13.089
1	1 10 51.95	1.8148	11 32 11.2	13.043
2	1 12 40.90	1.8171	11 45 12.4	12.997
3	1 14 30.00	1.8195	11 58 10.9	12.952
4	1 16 19.24	1.8219	12 11 6.6	12.903
5	1 18 8.63	1.8245	12 23 59.3	12.855
6	1 19 58.18	1.8271	12 36 49.2	12.806
7	1 21 47.88	1.8297	12 49 36.0	12.756
8	1 23 37.74	1.8324	13 2 19.9	12.706
9	1 25 27.77	1.8353	13 15 0.7	12.654
10	1 27 17.97	1.8381	13 27 38.4	12.602
11	1 29 8.34	1.8410	13 40 13.0	12.550
12	1 30 58.89	1.8440	13 52 44.4	12.496
13	1 32 49.62	1.8470	14 5 12.5	12.442
14	1 34 40.53	1.8501	14 17 37.4	12.387
15	1 36 31.63	1.8533	14 29 58.9	12.331
16	1 38 22.92	1.8565	14 42 17.1	12.275
17	1 40 14.41	1.8598	14 54 31.9	12.217
18	1 42 6.10	1.8632	15 6 43.2	12.160
19	1 43 57.99	1.8665	15 18 51.1	12.102
20	1 45 50.08	1.8700	15 30 55.4	12.042
21	1 47 42.39	1.8736	15 42 56.1	11.982
22	1 49 34.91	1.8772	15 54 53.2	11.920
23	1 51 27.65	1.8808	N. 16 6 46.5	11.858

WEDNESDAY 12.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	1 53 20.61	1.8846	N. 16 18 36.2	11.797
1	1 55 13.80	1.8883	16 30 22.1	11.733
2	1 57 7.21	1.8921	16 42 4.2	11.669
3	1 59 0.85	1.8960	16 53 42.4	11.604
4	2 0 54.73	1.8999	17 5 16.7	11.538
5	2 2 48.84	1.9039	17 16 47.0	11.472
6	2 4 43.20	1.9080	17 28 13.3	11.405
7	2 6 37.80	1.9121	17 39 35.6	11.337
8	2 8 32.65	1.9163	17 50 53.7	11.267
9	2 10 27.75	1.9204	18 2 7.7	11.198
10	2 12 23.10	1.9247	18 13 17.5	11.127
11	2 14 18.71	1.9290	18 24 23.0	11.056
12	2 16 14.58	1.9334	18 35 24.2	10.984
13	2 18 10.72	1.9378	18 46 21.1	10.912
14	2 20 7.12	1.9423	18 57 13.6	10.837
15	2 22 3.79	1.9468	19 8 1.6	10.762
16	2 24 0.73	1.9513	19 18 45.1	10.687
17	2 25 57.95	1.9559	19 29 24.0	10.611
18	2 27 55.44	1.9606	19 39 58.4	10.534
19	2 29 53.22	1.9653	19 50 28.1	10.455
20	2 31 51.28	1.9700	20 0 53.0	10.376
21	2 33 49.62	1.9748	20 11 13.2	10.297
22	2 35 48.25	1.9796	20 21 28.6	10.216
23	2 37 47.17	1.9845	20 31 39.1	10.134
24	2 39 46.39	1.9894	N. 20 41 44.7	10.052

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 13.					SATURDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 39 46.39	1.9894	N. 20 41 44.7	10.052	0	4 21 22.91	2.2464	N. 26 51 24.0	4.978
1	2 41 45.90	1.9943	20 51 45.3	9.968	1	4 23 37.85	2.2516	26 56 18.9	4.849
2	2 43 45.71	1.9993	21 1 40.9	9.884	2	4 25 53.10	2.2567	27 1 5.9	4.718
3	2 45 45.82	2.0044	21 11 31.4	9.799	3	4 28 8.65	2.2617	27 5 45.1	4.587
4	2 47 46.24	2.0095	21 21 16.8	9.713	4	4 30 24.50	2.2668	27 10 16.3	4.454
5	2 49 46.96	2.0145	21 30 57.0	9.626	5	4 32 40.66	2.2718	27 14 39.6	4.322
6	2 51 47.98	2.0196	21 40 31.9	9.537	6	4 34 57.11	2.2766	27 18 54.9	4.187
7	2 53 49.31	2.0248	21 50 1.5	9.449	7	4 37 13.85	2.2814	27 23 2.1	4.052
8	2 55 50.96	2.0300	21 59 25.8	9.360	8	4 39 30.88	2.2863	27 27 1.2	3.917
9	2 57 52.91	2.0352	22 8 44.7	9.269	9	4 41 48.20	2.2910	27 30 52.1	3.779
10	2 59 55.18	2.0405	22 17 58.1	9.177	10	4 44 5.80	2.2958	27 34 34.7	3.641
11	3 1 57.77	2.0458	22 27 5.9	9.084	11	4 46 23.69	2.3004	27 38 9.0	3.502
12	3 4 0.67	2.0510	22 36 8.2	8.992	12	4 48 41.85	2.3049	27 41 35.0	3.363
13	3 6 3.89	2.0563	22 45 4.9	8.897	13	4 51 0.28	2.3094	27 44 52.6	3.222
14	3 8 7.43	2.0617	22 53 55.8	8.801	14	4 53 18.98	2.3139	27 48 1.7	3.082
15	3 10 11.29	2.0671	23 2 41.0	8.705	15	4 55 37.95	2.3183	27 51 2.4	2.940
16	3 12 15.48	2.0725	23 11 20.4	8.607	16	4 57 57.18	2.3227	27 53 54.5	2.797
17	3 14 19.99	2.0779	23 19 53.9	8.509	17	5 0 16.67	2.3269	27 56 38.0	2.652
18	3 16 24.83	2.0833	23 28 21.5	8.410	18	5 2 36.41	2.3310	27 59 12.8	2.508
19	3 18 29.99	2.0888	23 36 43.1	8.310	19	5 4 56.39	2.3351	28 1 39.0	2.363
20	3 20 35.49	2.0943	23 44 58.7	8.209	20	5 7 16.62	2.3392	28 3 56.4	2.217
21	3 22 41.31	2.0998	23 53 8.2	8.107	21	5 9 37.09	2.3431	28 6 5.0	2.071
22	3 24 47.46	2.1053	24 1 11.5	8.003	22	5 11 57.79	2.3469	28 8 4.9	1.923
23	3 26 53.94	2.1108	N. 24 9 8.6	7.899	23	5 14 18.72	2.3507	N. 28 9 55.8	1.773
	FRIDAY 14.					SUNDAY 16.			
0	3 29 0.75	2.1163	N. 24 16 59.4	7.794	0	5 16 39.87	2.3543	N. 28 11 37.8	1.625
1	3 31 7.89	2.1218	24 24 43.9	7.688	1	5 19 1.24	2.3580	28 13 10.8	1.476
2	3 33 15.36	2.1273	24 32 22.0	7.582	2	5 21 22.83	2.3616	28 14 34.9	1.326
3	3 35 23.16	2.1328	24 39 53.7	7.474	3	5 23 44.63	2.3650	28 15 49.9	1.174
4	3 37 31.29	2.1383	24 47 18.9	7.365	4	5 26 6.63	2.3683	28 16 55.8	1.022
5	3 39 39.76	2.1439	24 54 37.5	7.254	5	5 28 28.83	2.3716	28 17 52.6	0.870
6	3 41 48.56	2.1494	25 1 49.4	7.143	6	5 30 51.22	2.3748	28 18 40.2	0.717
7	3 43 57.69	2.1549	25 8 54.7	7.032	7	5 33 13.80	2.3778	28 19 18.6	0.563
8	3 46 7.15	2.1604	25 15 53.2	6.919	8	5 35 36.56	2.3808	28 19 47.8	0.409
9	3 48 16.94	2.1659	25 22 45.0	6.806	9	5 37 59.50	2.3838	28 20 7.7	0.254
10	3 50 27.06	2.1714	25 29 29.9	6.690	10	5 40 22.61	2.3865	28 20 18.3	+0.099
11	3 52 37.51	2.1769	25 36 7.8	6.574	11	5 42 45.88	2.3892	28 20 19.6	−0.057
12	3 54 48.29	2.1824	25 42 38.8	6.457	12	5 45 9.31	2.3918	28 20 11.5	0.213
13	3 56 59.40	2.1878	25 49 2.7	6.339	13	5 47 32.90	2.3943	28 19 54.0	0.371
14	3 59 10.83	2.1933	25 55 19.5	6.220	14	5 49 56.63	2.3967	28 19 27.0	0.528
15	4 1 22.60	2.1988	26 1 29.1	6.100	15	5 52 20.50	2.3990	28 18 50.6	0.687
16	4 3 34.69	2.2042	26 7 31.5	5.980	16	5 54 44.51	2.4012	28 18 4.6	0.846
17	4 5 47.10	2.2095	26 13 26.7	5.858	17	5 57 8.64	2.4032	28 17 9.1	1.003
18	4 7 59.83	2.2149	26 19 14.5	5.735	18	5 59 32.89	2.4052	28 16 4.2	1.162
19	4 10 12.89	2.2203	26 24 54.9	5.611	19	6 1 57.26	2.4071	28 14 49.6	1.322
20	4 12 26.26	2.2255	26 30 27.8	5.487	20	6 4 21.74	2.4088	28 13 25.5	1.482
21	4 14 39.95	2.2308	26 35 53.3	5.362	21	6 6 46.32	2.4105	28 11 51.8	1.642
22	4 16 53.96	2.2361	26 41 11.2	5.235	22	6 9 11.00	2.4121	28 10 8.4	1.803
23	4 19 8.28	2.2413	26 46 21.5	5.107	23	6 11 35.77	2.4136	28 8 15.4	1.964
24	4 21 22.91	2.2464	N. 26 51 24.0	4.978	24	6 14 0.63	2.4149	N. 28 6 12.7	2.125

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
			MONDAY 17.					WEDNESDAY 19.	
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 14 0.63	2.4149	N. 28 6 12.7	2.125	0	8 9 31.48	2.3638	N. 23 19 30.2	9.687
1	6 16 25.56	2.4161	28 4 0.4	2.286	1	8 11 53.22	2.3608	23 9 44.6	9.832
2	6 18 50.56	2.4173	28 1 38.4	2.447	2	8 14 14.78	2.3578	22 59 50.4	9.975
3	6 21 15.63	2.4183	27 59 6.7	2.609	3	8 16 36.16	2.3548	22 49 47.6	10.117
4	6 23 40.75	2.4191	27 56 25.3	2.772	4	8 18 57.36	2.3518	22 39 36.3	10.258
5	6 26 5.92	2.4199	27 53 34.1	2.933	5	8 21 18.37	2.3486	22 29 16.6	10.398
6	6 28 31.14	2.4207	27 50 33.3	3.095	6	8 23 39.19	2.3454	22 18 48.5	10.538
7	6 30 56.40	2.4213	27 47 22.7	3.257	7	8 25 59.82	2.3423	22 8 12.0	10.677
8	6 33 21.69	2.4218	27 44 2.4	3.420	8	8 28 20.26	2.3391	21 57 27.3	10.814
9	6 35 47.01	2.4222	27 40 32.3	3.582	9	8 30 40.51	2.3358	21 46 34.3	10.951
10	6 38 12.35	2.4224	27 36 52.5	3.744	10	8 33 0.56	2.3325	21 35 33.2	11.085
11	6 40 37.70	2.4225	27 33 3.0	3.907	11	8 35 20.41	2.3293	21 24 24.1	11.219
12	6 43 3.05	2.4225	27 29 3.7	4.069	12	8 37 40.07	2.3259	21 13 6.9	11.352
13	6 45 28.40	2.4225	27 24 54.7	4.232	13	8 39 59.52	2.3225	21 1 41.8	11.484
14	6 47 53.75	2.4224	27 20 35.9	4.394	14	8 42 18.77	2.3192	20 50 8.8	11.615
15	6 50 19.09	2.4222	27 16 7.4	4.556	15	8 44 37.82	2.3158	20 38 28.0	11.744
16	6 52 44.41	2.4218	27 11 29.2	4.718	16	8 46 56.67	2.3124	20 26 39.5	11.872
17	6 55 9.70	2.4213	27 6 41.2	4.880	17	8 49 15.31	2.3090	20 14 43.3	12.000
18	6 57 34.97	2.4208	27 1 43.6	5.042	18	8 51 33.75	2.3056	20 2 39.5	12.126
19	7 0 0.20	2.4201	26 56 36.2	5.203	19	8 53 51.98	2.3021	19 50 28.2	12.250
20	7 2 25.38	2.4193	26 51 19.2	5.364	20	8 56 10.00	2.2987	19 38 9.5	12.373
21	7 4 50.51	2.4184	26 45 52.5	5.526	21	8 58 27.82	2.2953	19 25 43.4	12.496
22	7 7 15.59	2.4175	26 40 16.1	5.687	22	9 0 45.43	2.2918	19 13 10.0	12.617
23	7 9 40.61	2.4164	N. 26 34 30.1	5.847	23	9 3 2.84	2.2884	N. 19 0 29.4	12.736
			TUESDAY 18.					THURSDAY 20.	
0	7 12 5.56	2.4153	N. 26 28 34.5	6.007	0	9 5 20.04	2.2849	N. 18 47 41.7	12.854
1	7 14 30.44	2.4140	26 22 29.3	6.167	1	9 7 37.03	2.2815	18 34 46.9	12.972
2	7 16 55.24	2.4127	26 16 14.5	6.326	2	9 9 53.82	2.2781	18 21 45.1	13.087
3	7 19 19.96	2.4113	26 9 50.2	6.484	3	9 12 10.40	2.2747	18 8 36.4	13.202
4	7 21 44.60	2.4098	26 3 16.4	6.643	4	9 14 26.78	2.2713	17 55 20.9	13.314
5	7 24 9.14	2.4082	25 56 33.0	6.802	5	9 16 42.95	2.2678	17 41 58.7	13.426
6	7 26 33.58	2.4065	25 49 40.2	6.958	6	9 18 58.92	2.2644	17 28 29.8	13.537
7	7 28 57.92	2.4048	25 42 38.0	7.116	7	9 21 14.68	2.2610	17 14 54.3	13.645
8	7 31 22.15	2.4029	25 35 26.3	7.272	8	9 23 30.24	2.2578	17 1 12.4	13.752
9	7 33 46.27	2.4010	25 28 5.3	7.428	9	9 25 45.61	2.2544	16 47 24.0	13.859
10	7 36 10.27	2.3989	25 20 34.9	7.584	10	9 28 0.77	2.2510	16 33 29.3	13.963
11	7 38 34.14	2.3968	25 12 55.2	7.739	11	9 30 15.73	2.2478	16 19 28.4	14.067
12	7 40 57.89	2.3948	25 5 6.2	7.893	12	9 32 30.50	2.2445	16 5 21.3	14.168
13	7 43 21.51	2.3925	24 57 8.0	8.047	13	9 34 45.07	2.2412	15 51 8.2	14.268
14	7 45 44.99	2.3902	24 49 0.6	8.200	14	9 36 59.44	2.2380	15 36 49.1	14.367
15	7 48 8.33	2.3878	24 40 44.0	8.353	15	9 39 13.63	2.2348	15 22 24.1	14.465
16	7 50 31.53	2.3854	24 32 18.3	8.503	16	9 41 27.62	2.2317	15 7 53.3	14.561
17	7 52 54.58	2.3829	24 23 43.6	8.654	17	9 43 41.43	2.2286	14 53 16.8	14.655
18	7 55 17.48	2.3803	24 14 59.8	8.805	18	9 45 55.05	2.2254	14 38 34.7	14.747
19	7 57 40.22	2.3777	24 6 7.0	8.954	19	9 48 8.48	2.2224	14 23 47.1	14.839
20	8 0 2.80	2.3750	23 57 5.3	9.102	20	9 50 21.74	2.2194	14 8 54.0	14.929
21	8 2 25.22	2.3723	23 47 54.8	9.249	21	9 52 34.81	2.2164	13 53 55.6	15.017
22	8 4 47.48	2.3695	23 38 35.4	9.397	22	9 54 47.71	2.2135	13 38 52.0	15.103
23	8 7 9.56	2.3667	23 29 7.1	9.543	23	9 57 0.43	2.2106	13 23 43.2	15.189
24	8 9 31.48	2.3638	N. 23 19 30.2	9.687	24	9 59 12.98	2.2078	N. 13 8 29.3	15.272

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 21.					**SUNDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 59 12.98	2.2078	N. 13 8 29.3	15.272	0	11 43 0.36	2.1433	S. 0 9 53.9	17.346
1	10 1 25.36	2.2049	12 53 10.5	15.354	1	11 45 8.97	2.1437	0 27 14.7	17.347
2	10 3 37.57	2.2022	12 37 46.8	15.435	2	11 47 17.60	2.1442	0 44 35.5	17.346
3	10 5 49.62	2.1995	12 22 18.3	15.514	3	11 49 26.27	2.1448	1 1 56.2	17.343
4	10 8 1.51	2.1968	12 6 45.1	15.592	4	11 51 34.98	2.1455	1 19 16.7	17.339
5	10 10 13.24	2.1942	11 51 7.3	15.667	5	11 53 43.73	2.1463	1 36 36.9	17.333
6	10 12 24.81	2.1917	11 35 25.1	15.741	6	11 55 52.53	2.1471	1 53 56.7	17.326
7	10 14 36.24	2.1892	11 19 38.4	15.814	7	11 58 1.38	2.1481	2 11 16.0	17.317
8	10 16 47.51	2.1867	11 3 47.4	15.884	8	12 0 10.30	2.1492	2 28 34.7	17.306
9	10 18 58.64	2.1843	10 47 52.3	15.953	9	12 2 19.28	2.1503	2 45 52.7	17.293
10	10 21 9.63	2.1820	10 31 53.0	16.022	10	12 4 28.33	2.1514	3 3 9.9	17.278
11	10 23 20.48	2.1797	10 15 49.7	16.087	11	12 6 37.45	2.1528	3 20 26.1	17.262
12	10 25 31.19	2.1774	9 59 42.5	16.152	12	12 8 46.66	2.1541	3 37 41.3	17.244
13	10 27 41.77	2.1753	9 43 31.5	16.214	13	12 10 55.94	2.1555	3 54 55.4	17.224
14	10 29 52.22	2.1732	9 27 16.8	16.276	14	12 13 5.32	2.1571	4 12 8.2	17.202
15	10 32 2.55	2.1712	9 10 58.4	16.336	15	12 15 14.79	2.1587	4 29 19.7	17.179
16	10 34 12.76	2.1692	8 54 36.5	16.392	16	12 17 24.36	2.1603	4 46 29.7	17.154
17	10 36 22.85	2.1673	8 38 11.3	16.448	17	12 19 34.03	2.1621	5 3 38.2	17.127
18	10 38 32.83	2.1654	8 21 42.7	16.503	18	12 21 43.81	2.1639	5 20 45.0	17.098
19	10 40 42.70	2.1636	8 5 10.9	16.557	19	12 23 53.70	2.1658	5 37 50.0	17.068
20	10 42 52.46	2.1618	7 48 35.9	16.607	20	12 26 3.71	2.1678	5 54 53.2	17.037
21	10 45 2.12	2.1602	7 31 58.0	16.657	21	12 28 13.84	2.1699	6 11 54.4	17.002
22	10 47 11.68	2.1586	7 15 17.1	16.705	22	12 30 24.10	2.1721	6 28 53.5	16.967
23	10 49 21.15	2.1571	N. 6 58 33.4	16.751	23	12 32 34.49	2.1743	S. 6 45 50.4	16.930
	SATURDAY 22.					**MONDAY 24.**			
0	10 51 30.53	2.1556	N. 6 41 47.0	16.795	0	12 34 45.02	2.1767	S. 7 2 45.1	16.892
1	10 53 39.82	2.1543	6 24 58.0	16.837	1	12 36 55.69	2.1790	7 19 37.4	16.850
2	10 55 49.04	2.1530	6 8 6.5	16.879	2	12 39 6.50	2.1814	7 36 27.1	16.807
3	10 57 58.18	2.1518	5 51 12.5	16.918	3	12 41 17.46	2.1840	7 53 14.3	16.763
4	11 0 7.25	2.1506	5 34 16.3	16.956	4	12 43 28 58	2.1867	8 9 58.7	16.717
5	11 2 16.25	2.1494	5 17 17.8	16.992	5	12 45 39.86	2.1893	8 26 40.3	16.669
6	11 4 25.18	2.1484	5 0 17.3	17.026	6	12 47 51.30	2.1922	8 43 19.0	16.620
7	11 6 34.06	2.1475	4 43 14.7	17 058	7	12 50 2.92	2.1951	8 59 54.7	16.568
8	11 8 42.88	2.1466	4 26 10.3	17.088	8	12 52 14.71	2.1979	9 16 27.2	16.515
9	11 10 51.65	2.1458	4 9 4.1	17.117	9	12 54 26.67	2.2008	9 32 56.5	16.461
10	11 13 0.38	2.1451	3 51 56.2	17.146	10	12 56 38.81	2.2039	9 49 22.5	16.404
11	11 15 9.06	2.1444	3 34 46.6	17.172	11	12 58 51.14	2.2072	10 5 45.0	16.345
12	11 17 17.71	2.1439	3 17 35.6	17.195	12	13 1 3.67	2.2103	10 22 3.9	16.285
13	11 19 26.33	2.1434	3 0 23.2	17.217	13	13 3 16.38	2.2136	10 38 19.2	16.223
14	11 21 34.92	2.1430	2 43 9.6	17.237	14	13 5 29.30	2.2170	10 54 30.7	16.160
15	11 23 43.49	2.1426	2 25 54.8	17.256	15	13 7 42.42	2.2203	11 10 38.4	16.095
16	11 25 52.03	2.1423	2 8 38.9	17.272	16	13 9 55.74	2.2238	11 26 42.1	16.027
17	11 28 0.57	2.1423	1 51 22.1	17.287	17	13 12 9.28	2.2274	11 42 41.7	15.959
18	11 30 9.10	2.1422	1 34 4.4	17.301	18	13 14 23.03	2.2310	11 58 37.2	15.889
19	11 32 17.63	2.1421	1 16 46.0	17.312	19	13 16 37.00	2.2347	12 14 28.4	15.817
20	11 34 26.15	2.1421	0 59 26.9	17.322	20	13 18 51.19	2.2384	12 30 15.2	15.742
21	11 36 34.68	2.1423	0 42 7.3	17.331	21	13 21 5.61	2.2423	12 45 57.5	15.667
22	11 38 43.22	2.1425	0 24 47.2	17.337	22	13 23 20.26	2.2461	13 1 35.3	15.591
23	11 40 51.78	2.1428	N. 0 7 26.8	17.342	23	13 25 35.14	2.2500	13 17 8.4	15.512
24	11 43 0.36	2.1433	S. 0 9 53.9	17.346	24	13 27 50.26	2.2540	S. 13 32 36.7	15.431

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 25.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	13 27 50.26	2.2540	S. 13 32 36.7	15.431
1	13 30 5.62	2.2581	13 48 0.1	15.348
2	13 32 21.23	2.2622	14 3 18.5	15.263
3	13 34 37.08	2.2663	14 18 31.7	15.177
4	13 36 53.18	2.2705	14 33 39.8	15.091
5	13 39 9.54	2.2748	14 48 42.6	15.002
6	13 41 26.16	2.2791	15 3 40.0	14.910
7	13 43 43.03	2.2834	15 18 31.8	14.817
8	13 46 0.17	2.2878	15 33 18.1	14.724
9	13 48 17.57	2.2923	15 47 58.7	14.628
10	13 50 35.25	2.2969	16 2 33.5	14.531
11	13 52 53.20	2.3013	16 17 2.4	14.431
12	13 55 11.41	2.3058	16 31 25.2	14.330
13	13 57 29.90	2.3105	16 45 42.0	14.227
14	13 59 48.67	2.3153	16 59 52.5	14.122
15	14 2 7.73	2.3199	17 13 56.7	14.017
16	14 4 27.06	2.3246	17 27 54.6	13.911
17	14 6 46.68	2.3294	17 41 46.0	13.801
18	14 9 6.59	2.3343	17 55 30.7	13.689
19	14 11 26.79	2.3390	18 9 8.7	13.577
20	14 13 47.27	2.3438	18 22 40.0	13.464
21	14 16 8.05	2.3487	18 36 4.4	13.349
22	14 18 29.11	2.3535	18 49 21.9	13.232
23	14 20 50.47	2.3585	S. 19 2 32.2	13.112

WEDNESDAY 26.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	14 23 12.13	2.3634	S. 19 15 35.4	12.992
1	14 25 34.08	2.3683	19 28 31.3	12.870
2	14 27 56.33	2.3733	19 41 19.8	12.747
3	14 30 18.88	2.3783	19 54 1.0	12.623
4	14 32 41.73	2.3833	20 6 34.6	12.496
5	14 35 4.87	2.3882	20 19 0.5	12.367
6	14 37 28.31	2.3932	20 31 18.7	12.238
7	14 39 52.05	2.3982	20 43 29.1	12.107
8	14 42 16.09	2.4031	20 55 31.6	11.975
9	14 44 40.42	2.4081	21 7 26.1	11.841
10	14 47 5.05	2.4130	21 19 12.5	11.706
11	14 49 29.98	2.4179	21 30 50.8	11.569
12	14 51 55.20	2.4228	21 42 20.8	11.431
13	14 54 20.72	2.4278	21 53 42.5	11.291
14	14 56 46.53	2.4327	22 4 55.7	11.149
15	14 59 12.64	2.4376	22 16 0.4	11.007
16	15 1 39.04	2.4423	22 26 56.5	10.862
17	15 4 5.72	2.4471	22 37 43.9	10.717
18	15 6 32.69	2.4520	22 48 22.6	10.571
19	15 8 59.96	2.4568	22 58 52.4	10.422
20	15 11 27.50	2.4614	23 9 13.3	10.273
21	15 13 55.33	2.4661	23 19 25.2	10.122
22	15 16 23.43	2.4707	23 29 28.0	9.971
23	15 18 51.81	2.4753	23 39 21.7	9.817
24	15 21 20.47	2.4799	S. 23 49 6.1	9.662

THURSDAY 27.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min
	h m s	s	° ′ ″	″
0	15 21 20.47	2.4799	S. 23 49 6.1	9.6
1	15 23 49.40	2.4844	23 58 41.2	9.5
2	15 26 18.60	2.4888	24 8 7.0	9.3
3	15 28 48.06	2.4932	24 17 23.3	9.1
4	15 31 17.78	2.4975	24 26 30.1	9.0
5	15 33 47.76	2.5018	24 35 27.3	8.8
6	15 36 17.99	2.5059	24 44 14.8	8.7
7	15 38 48.47	2.5101	24 52 52.6	8.5
8	15 41 19.20	2.5142	25 1 20.7	8.3
9	15 43 50.17	2.5181	25 9 38.9	8.2
10	15 46 21.37	2.5220	25 17 47.1	8.0
11	15 48 52.81	2.5258	25 25 45.4	7.8
12	15 51 24.47	2.5295	25 33 33.6	7.7
13	15 53 56.35	2.5332	25 41 11.7	7.5
14	15 56 28.45	2.5368	25 48 39.7	7.3
15	15 59 0.76	2.5403	25 55 57.5	7.21
16	16 1 33.28	2.5436	26 3 5.0	7.0
17	16 4 5.99	2.5468	26 10 2.2	6.8
18	16 6 38.90	2.5500	26 16 49.0	6.6
19	16 9 11.99	2.5531	26 23 25.4	6.51
20	16 11 45.27	2.5561	26 29 51.3	6.34
21	16 14 18.72	2.5589	26 36 6.7	6.16
22	16 16 52.34	2.5617	26 42 11.6	5.99
23	16 19 26.12	2.5643	S. 26 48 5.8	5.81

FRIDAY 28.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min
0	16 22 0.05	2.5668	S. 26 53 49.4	5.63
1	16 24 34.13	2.5692	26 59 22.4	5.46
2	16 27 8.35	2.5715	27 4 44.6	5.28
3	16 29 42.71	2.5737	27 9 56.1	5.10
4	16 32 17.19	2.5757	27 14 56.8	4.92
5	16 34 51.79	2.5776	27 19 46.7	4.74
6	16 37 26.50	2.5794	27 24 25.7	4.56
7	16 40 1.32	2.5811	27 28 53.9	4.37
8	16 42 36.23	2.5825	27 33 11.2	4.19
9	16 45 11.22	2.5838	27 37 17.5	4.01
10	16 47 46.29	2.5852	27 41 12.9	3.83
11	16 50 21.44	2.5863	27 44 57.3	3.64
12	16 52 56.65	2.5873	27 48 30.8	3.46
13	16 55 31.91	2.5881	27 51 53.2	3.28
14	16 58 7.22	2.5888	27 55 4.7	3.09
15	17 0 42.57	2.5893	27 58 5.1	2.91
16	17 3 17.94	2.5898	28 0 54.5	2.73
17	17 5 53.34	2.5901	28 3 32.9	2.54
18	17 8 28.75	2.5902	28 6 0.2	2.36
19	17 11 4.16	2.5901	28 8 16.5	2.17
20	17 13 39.56	2.5899	28 10 21.7	1.99
21	17 16 14.95	2.5897	28 12 15.9	1.81
22	17 18 50.32	2.5893	28 13 59.0	1.62
23	17 21 25.66	2.5887	28 15 31.1	1.443
24	17 24 0.96	2.5879	S. 28 16 52.2	1.259

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 29.			
	h m s	s	° ′ ″	″
0	17 24 0.96	2.5879	S. 28 16 52.2	1.259
1	17 26 36.21	2.5870	28 18 2.2	1.075
2	17 29 11.40	2.5859	28 19 1.2	0.892
3	17 31 46.52	2.5848	28 19 49.2	0.708
4	17 34 21.57	2.5834	28 20 26.2	0.526
5	17 36 56.53	2.5818	28 20 52.3	0.343
6	17 39 31.39	2.5803	28 21 7.4	−0.160
7	17 42 6.16	2.5786	28 21 11.5	+0.022
8	17 44 40.82	2.5766	28 21 4.8	0.203
9	17 47 15.35	2.5745	28 20 47.1	0.385
10	17 49 49.76	2.5723	28 20 18.6	0.565
11	17 52 24.03	2.5700	28 19 39.3	0.745
12	17 54 58.16	2.5676	28 18 49.2	0.925
13	17 57 32.14	2.5649	28 17 48.3	1.104
14	18 0 5.95	2.5621	28 16 36.7	1.282
15	18 2 39.59	2.5593	28 15 14.4	1.461
16	18 5 13.06	2.5562	28 13 41.4	1.638
17	18 7 46.33	2.5530	28 11 57.8	1.815
18	18 10 19.42	2.5498	28 10 3.6	1.991
19	18 12 52.30	2.5462	28 7 58.9	2.166
20	18 15 24.96	2.5426	28 5 43.7	2.341
21	18 17 57.41	2.5389	28 3 18.0	2.515
22	18 20 29.63	2.5351	28 0 41.9	2.688
23	18 23 1.62	2.5312	S. 27 57 55.4	2.860
	SUNDAY 30.			
0	18 25 33.37	2.5271	S. 27 54 58.7	3.031
1	18 28 4.87	2.5228	27 51 51.7	3.202
2	18 30 36.21	2.5186	27 48 34.5	3.371
3	18 33 7.10	2.5142	27 45 7.2	3.539
4	18 35 37.81	2.5096	27 41 29.8	3.707
5	18 38 8.25	2.5050	27 37 42.3	3.874
6	18 40 38.41	2.5002	27 33 44.9	4.039
7	18 43 8.28	2.4954	27 29 37.6	4.203
8	18 45 37.86	2.4905	27 25 20.5	4.367
9	18 48 7.14	2.4854	27 20 53.6	4.529
10	18 50 36.11	2.4803	27 16 17.0	4.691
11	18 53 4.77	2.4750	27 11 30.7	4.851
12	18 55 33.11	2.4697	27 6 34.9	5.010
13	18 58 1.13	2.4643	27 1 29.5	5.168
14	19 0 28.82	2.4587	26 56 14.7	5.324
15	19 2 56.17	2.4530	26 50 50.6	5.479
16	19 5 23.18	2.4474	26 45 17.2	5.634
17	19 7 49.86	2.4417	26 39 34.5	5.787
18	19 10 16.18	2.4358	26 33 42.7	5.939
19	19 12 42.15	2.4298	26 27 41.8	6.090
20	19 15 7.76	2.4239	26 21 31.9	6.239
21	19 17 33.02	2.4179	26 15 13.1	6.387
22	19 19 57.91	2.4118	26 8 45.5	6.533
23	19 22 22.43	2.4055	26 2 9.1	6.679
24	19 24 46.57	2.3993	S. 25 55 24.0	6.823

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 31.			
	h m s	s	° ′ ″	″
0	19 24 46.57	2.3993	S. 25 55 24.0	6.823
1	19 27 10.34	2.3930	25 48 30.3	6.966
2	19 29 33.73	2.3867	25 41 28.1	7.107
3	19 31 56.74	2.3803	25 34 17.4	7.248
4	19 34 19.36	2.3738	25 26 58.3	7.387
5	19 36 41.59	2.3673	25 19 31.0	7.523
6	19 39 3.43	2.3608	25 11 55.5	7.660
7	19 41 24.88	2.3543	25 4 11.8	7.794
8	19 43 45.94	2.3477	24 56 20.2	7.927
9	19 46 6.60	2.3410	24 48 20.6	8.059
10	19 48 26.86	2.3343	24 40 13.1	8.190
11	19 50 46.71	2.3275	24 31 57.8	8.319
12	19 53 6.16	2.3208	24 23 34.8	8.447
13	19 55 25.21	2.3141	24 15 4.2	8.572
14	19 57 43.85	2.3073	24 6 26.1	8.697
15	20 0 2.09	2.3005	23 57 40.6	8.820
16	20 2 19.91	2.2937	23 48 47.7	8.942
17	20 4 37.33	2.2869	23 39 47.5	9.063
18	20 6 54.34	2.2801	23 30 40.1	9.182
19	20 9 10.94	2.2732	23 21 25.7	9.299
20	20 11 27.12	2.2663	23 12 4.2	9.416
21	20 13 42.90	2.2596	23 2 35.8	9.530
22	20 15 58.27	2.2528	22 53 0.6	9.643
23	20 18 13.23	2.2458	S. 22 43 18.6	9.756
	TUESDAY, SEPTEMBER 1.			
0	20 20 27.77	2.2389	S. 22 33 29.9	9.867

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Aug.	5	12	40.7
☾	Last Quarter		13	12	56.0
●	New Moon		21	0	26.5
☽	First Quarter		27	16	52.5

			d	h
☾	Apogee	Aug.	11	21.8
☾	Perigee		23	18.5

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	10 39 22.41	9.075	N. 8 30 8.3	−54.22	15 52.96	64.40	0 9.01	0.780
Wed.	2	10 43 0.05	9.062	8 8 22.9	54.55	15 53.19	64.36	0 9.86	0.793
Thur.	3	10 46 37.39	9.050	7 46 29.8	54.87	15 53.43	64.32	0 29.02	0.805
Frid.	4	10 50 14.44	9.039	7 24 29.3	−55.18	15 53.66	64.28	0 48.46	0.816
Sat.	5	10 53 51.24	9.029	7 2 21.6	55.47	15 53.90	64.24	1 8.16	0.826
SUN.	6	10 57 27.81	9.020	6 40 6.9	55.75	15 54.13	64.21	1 28.09	0.835
Mon.	7	11 1 4.16	9.011	6 17 45.5	−56.03	15 54.37	64.18	1 48.23	0.843
Tues.	8	11 4 40.32	9.003	5 55 17.8	56.28	15 54.61	64.15	2 8.56	0.851
Wed.	9	11 8 16.31	8.996	5 32 44.1	56.52	15 54.85	64.12	2 29.07	0.858
Thur.	10	11 11 52.14	8.990	5 10 4.8	−56.75	15 55.09	64.10	2 49.74	0.864
Frid.	11	11 15 27.84	8.985	4 47 20.2	56.97	15 55.34	64.08	3 10.55	0.869
Sat.	12	11 19 3.43	8.981	4 24 30.5	57.18	15 55.58	64.06	3 31.46	0.873
SUN.	13	11 22 38.93	8.978	4 1 36.0	−57.37	15 55.83	64.04	3 52.45	0.876
Mon.	14	11 26 14.36	8.975	3 38 37.1	57.54	15 56.08	64.03	4 13.52	0.879
Tues.	15	11 29 49.73	8.973	3 15 34.1	57.70	15 56.33	64.02	4 34.65	0.881
Wed.	16	11 33 25.06	8.972	2 52 27.4	−57.85	15 56.58	64.01	4 55.81	0.881
Thur.	17	11 37 0.38	8.972	2 29 17.3	57.98	15 56.84	64.01	5 16.98	0.882
Frid.	18	11 40 35.70	8.972	2 6 4.2	58.10	15 57.10	64.01	5 38.15	0.882
Sat.	19	11 44 11.04	8.973	1 42 48.4	−58.20	15 57.36	64.01	5 59.31	0.881
SUN.	20	11 47 46.42	8.975	1 19 30.3	58.29	15 57.62	64.02	6 20.44	0.879
Mon.	21	11 51 21.85	8.978	0 56 10.3	58.36	15 57.89	64.03	6 41.51	0.877
Tues.	22	11 54 57.34	8.981	0 32 48.8	−58.41	15 58.16	64.04	7 2.52	0.874
Wed.	23	11 58 32.91	8.985	N. 0 9 26.1	58.46	15 58.44	64.06	7 23.44	0.870
Thur.	24	12 2 8.58	8.989	S. 0 13 57.4	58.49	15 58.71	64.08	7 44.27	0.866
Frid.	25	12 5 44.36	8.994	0 37 21.3	−58.50	15 58.99	64.10	8 4.98	0.861
Sat.	26	12 9 20.28	9.000	1 0 45.3	58.50	15 59.26	64.12	8 25.56	0.854
SUN.	27	12 12 56.36	9.007	1 24 9.0	58.48	15 59.54	64.15	8 45.98	0.847
Mon.	28	12 16 32.62	9.015	1 47 32.2	−58.44	15 59.82	64.18	9 6.22	0.839
Tues.	29	12 20 9.07	9.024	2 10 54.4	58.40	16 0.10	64.21	9 26.27	0.830
Wed.	30	12 23 45.75	9.034	2 34 15.4	58.34	16 0.38	64.25	9 46.09	0.821
Thur.	31	12 27 22.67	9.044	S. 2 57 34.9	−58.26	16 0.66	64.29	10 5.66	0.810

Note.—The mean time of semidiameter passing meridian may be found by subtracting 0ˢ.18 from the sidereal time. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	10 39 22.39	9.077	N. 8 30 8.4	−54.23	0 9.02	0.780	10 39 13.38
Wed.	2	10 43 0.07	9.064	8 8 22.8	54.56	0 9.86	0.793	10 43 9.93
Thur.	3	10 46 37.45	9.052	7 46 29.4	54.88	0 29.03	0.805	10 47 6.48
Frid.	4	10 50 14.56	9.041	7 24 28.6	−55.18	0 48.48	0.816	10 51 3.04
Sat.	5	10 53 51.41	9.031	7 2 20.5	55.47	1 8.18	0.826	10 54 59.59
SUN.	6	10 57 28.03	9.022	6 40 5.5	55.76	1 28.12	0.835	10 58 56.15
Mon.	7	11 1 4.43	9.013	6 17 43.9	−56.03	1 48.27	0.843	11 2 52.70
Tues.	8	11 4 40.64	9.005	5 55 15.9	56.29	2 8.61	0.851	11 6 49.25
Wed.	9	11 8 16.68	8.998	5 32 41.9	56.53	2 29.12	0.858	11 10 45.81
Thur.	10	11 11 52.57	8.992	5 10 2.2	−56.76	2 49.79	0.864	11 14 42.36
Frid.	11	11 15 28.32	8.987	4 47 17.2	56.98	3 10.60	0.869	11 18 38.92
Sat.	12	11 19 3.96	8.983	4 24 27.1	57.19	3 31.51	0.873	11 22 35.47
SUN.	13	11 22 39.51	8.980	4 1 32.3	−57.38	3 52.51	0.876	11 26 32.02
Mon.	14	11 26 14.98	8.977	3 38 33.0	57.55	4 13.59	0.879	11 30 28.58
Tues.	15	11 29 50.41	8.975	3 15 29.7	57.71	4 34.72	0.881	11 34 25.13
Wed.	16	11 33 25.80	8.974	2 52 22.6	−57.86	4 55.88	0.881	11 38 21.68
Thur.	17	11 37 1.17	8.974	2 29 12.2	58.00	5 17.06	0.882	11 42 18.24
Frid.	18	11 40 36.55	8.974	2 5 58.7	58.12	5 38.24	0.882	11 46 14.79
Sat.	19	11 44 11.94	8.975	1 42 42.6	−58.22	5 59.40	0.881	11 50 11.34
SUN.	26	11 47 47.37	8.977	1 19 24.1	58.31	6 20.53	0.879	11 54 7.90
Mon.	21	11 51 22.85	8.980	0 56 3.8	58.38	6 41.61	0.877	11 58 4.45
Tues.	22	11 54 58.39	8.983	0 32 42.0	−58.43	7 2.62	0.874	12 2 1.00
Wed.	23	11 58 34.01	8.987	N. 0 9 18.9	58.47	7 23.55	0.870	12 5 57.56
Thur.	24	12 2 9.73	8.991	S. 0 14 4.9	58.50	7 44.38	0.866	12 9 54.11
Frid.	25	12 5 45.57	8.996	0 37 29.1	−58.51	8 5.10	0.861	12 13 50.67
Sat.	26	12 9 21.54	9.002	1 0 53.4	58.51	8 25.68	0.854	12 17 47.22
SUN.	27	12 12 57.67	9.009	1 24 17.5	58.49	8 46.10	0.847	12 21 43.77
Mon.	28	12 16 33.98	9.017	1 47 41.0	−58.46	9 6.35	0.839	12 25 40.33
Tues.	29	12 20 10.49	9.026	2 11 3.6	58.42	9 26.40	0.830	12 29 36.88
Wed.	30	12 23 47.22	9.036	2 34 24.9	58.36	9 46.22	0.821	12 33 33.43
Thur.	31	12 27 24.19	9.046	S. 2 57 44.7	−58.28	10 5.80	0.810	12 37 29.99

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations increasing.

Diff. for 1 Hour, +9s.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ'	Diff. for 1 Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	244	158 11 53.0	11 11.8	145.16	−0.34	0.003 8735	−43.9	13 18 35.44
2	245	159 9 57.6	9 16.3	145.22	0.22	0.003 7679	44.2	13 14 39.53
3	246	160 8 3.8	7 22.4	145.29	−0.09	0.003 6618	44.4	13 10 43.62
4	247	161 6 11.7	5 30.1	145.36	+0.04	0.003 5550	−44.6	13 6 47.71
5	248	162 4 21.3	3 39.6	145.44	0.16	0.003 4478	44.8	13 2 51.80
6	249	163 2 32.6	1 50.8	145.51	0.28	0.003 3401	45.0	12 58 55.90
7	250	164 0 45.8	0 3.9	145.59	+0.38	0.003 2318	−45.2	12 54 59.99
8	251	164 59 1.0	58 18.9	145.67	0.48	0.003 1230	45.5	12 51 4.08
9	252	165 57 18.0	56 35.9	145.75	0.53	0.003 0136	45.7	12 47 8.17
10	253	166 55 37.1	54 54.9	145.83	+0.58	0.002 9035	−46.0	12 43 12.26
11	254	167 53 58.3	53 15.9	145.92	0.59	0.002 7928	46.3	12 39 16.36
12	255	168 52 21.5	51 39.0	146.01	0.56	0.002 6814	46.6	12 35 20.45
13	256	169 50 46.9	50 4.3	146.10	+0.52	0.002 5692	−46.9	12 31 24.54
14	257	170 49 14.4	48 31.7	146.19	0.45	0.002 4560	47.3	12 27 28.63
15	258	171 47 44.0	47 1.2	146.28	0.36	0.002 3419	47.7	12 23 32.72
16	259	172 46 15.7	45 32.8	146.37	+0.23	0.002 2268	−48.2	12 19 36.82
17	260	173 44 49.6	44 6.6	146.46	+0.10	0.002 1105	48.7	12 15 40.91
18	261	174 43 25.6	42 42.5	146.54	−0.05	0.001 9929	49.2	12 11 45.00
19	262	175 42 3.6	41 20.4	146.62	−0.18	0.001 8741	−49.8	12 7 49.09
20	263	176 40 43.6	40 0.2	146.70	0.32	0.001 7540	50.3	12 3 53.18
21	264	177 39 25.4	38 42.0	146.78	0.44	0.001 6327	50.8	11 59 57.28
22	265	178 38 9.1	37 25.6	146.86	−0.53	0.001 5102	−51.3	11 56 1.37
23	266	179 36 54.6	36 11.0	146.93	0.58	0.001 3866	51.7	11 52 5.46
24	267	180 35 41.8	34 58.0	147.00	0.61	0.001 2622	52.0	11 48 9.56
25	268	181 34 30.7	33 46.8	147.07	−0.61	0.001 1370	−52.3	11 44 13.65
26	269	182 33 21.3	32 37.3	147.14	0.59	0.001 0112	52.5	11 40 17.74
27	270	183 32 13.6	31 29.5	147.21	0.52	0.000 8851	52.6	11 36 21.83
28	271	184 31 7.6	30 23.4	147.28	−0.44	0.000 7588	−52.6	11 32 25.92
29	272	185 30 3.3	29 19.0	147.36	0.32	0.000 6324	52.6	11 28 30.02
30	273	186 29 0.9	28 16.4	147.43	0.19	0.000 5061	52.6	11 24 34.11
31	274	187 28 0.2	27 15.7	147.51	−0.06	0.000 3800	−52.5	11 20 38.20

Note.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ' are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 28.1	15 24.0	56 40.45	−1.269	56 25.34	−1.249	10 1.7	2.08	11.0
2	15 20.0	15 16.0	56 10.50	1.224	55 55.98	1.194	10 49.5	1.91	12.0
3	15 12.2	15 8.4	55 41.85	1.159	55 28.19	1.117	11 33.8	1.78	13.0
4	15 4.9	15 1.5	55 15.08	−1.066	55 2.64	−1.004	12 15.5	1.70	14.0
5	14 58.3	14 55.4	54 51.02	0.931	54 40.34	0.847	12 55.7	1.66	15.0
6	14 52.8	14 50.5	54 30.75	0.749	54 22.42	0.637	13 35.6	1.67	16.0
7	14 48.6	14 47.2	54 15.52	−0.511	54 10.22	−0.370	14 16.2	1.72	17.0
8	14 46.2	14 45.8	54 6.69	−0.216	54 5.09	−0.050	14 58.3	1.80	18.0
9	14 45.9	14 46.6	54 5.54	+0.128	54 8.20	+0.317	15 42.8	1.91	19.0
10	14 48.0	14 50.0	54 13.19	+0.515	54 20.59	+0.718	16 30.2	2.04	20.0
11	14 52.7	14 56.1	54 30.44	0.925	54 42.80	1.134	17 20.8	2.17	21.0
12	15 0.1	15 4.8	54 57.65	1.339	55 14.92	1.538	18 14.0	2.26	22.0
13	15 10.2	15 16.1	55 34.52	+1.726	55 56.28	+1.897	19 8.7	2.29	23.0
14	15 22.6	15 29.5	56 19.96	2.047	56 45.31	2.171	20 3.6	2.27	24.0
15	15 36.7	15 44.2	57 11.93	2.260	57 39.39	2.310	20 57.5	2.21	25.0
16	15 51.8	15 59.3	58 7.18	+2.315	58 34.74	+2.269	21 49.8	2.14	26.0
17	16 6.6	16 13.4	59 1.43	2.171	59 26.63	2.019	22 40.6	2.10	27.0
18	16 19.7	16 25.2	59 49.67	1.812	60 9.92	1.555	23 30.7	2.09	28.0
19	16 29.8	16 33.4	60 26.81	+1.255	60 39.90	+0.921	6	. .	29.0
20	16 35.8	16 37.1	60 48.82	+0.565	60 53.41	+0.199	0 21.1	2.12	0.6
21	16 37.1	16 36.0	60 53.60	−0.166	60 49.50	−0.514	1 13.0	2.21	1.6
22	16 33.8	16 30.6	60 41.40	−0.832	60 29.68	−1.114	2 7.5	2.34	2.6
23	16 26.5	16 21.8	60 14.82	1.354	59 57.36	1.548	3 5.2	2.47	3.6
24	16 16.5	16 10.8	59 37.85	1.696	59 16.83	1.799	4 5.8	2.56	4.6
25	16 4.8	15 58.6	58 54.84	−1.859	58 32.36	−1.881	5 7.6	2.57	5.6
26	15 52.5	15 46.4	58 9.82	1.871	57 47.56	1.836	6 8.3	2.48	6.6
27	15 40.5	15 34.8	57 25.84	1.781	57 4.89	1.708	7 5.8	2.31	7.6
28	15 29.4	15 24.2	56 44.90	−1.623	56 25.96	−1.533	7 58.8	2.11	8.6
29	15 19.3	15 14.8	56 8.13	1.438	55 51.45	1.342	8 47.3	1.94	9.6
30	15 10.5	15 6.6	55 35.93	1.245	55 21.57	1.150	9 32.0	1.80	10.6
31	15 3.0	14 59.7	55 8.33	−1.056	54 56.21	−0.964	10 14.0	1.71	11.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.
	TUESDAY 1.					THURSDAY 3.		
	h m s	s	° ′ ″	″		h m s	s	° ′ ″
0	20 20 27.77	2.2389	S. 22 33 29.9	9.867	0	22 0 32.89	1.9479	S. 12 59 35.3
1	20 22 41.90	2.2322	22 23 34.6	9.975	1	22 2 29.62	1.9432	12 46 2.0
2	20 24 55.63	2.2253	22 13 32.9	10.082	2	22 4 26.07	1.9385	12 32 26.1
3	20 27 8.94	2.2185	22 3 24.8	10.188	3	22 6 22.24	1.9338	12 18 47.6
4	20 29 21.85	2.2118	21 53 10.3	10.292	4	22 8 18.13	1.9292	12 5 6.6
5	20 31 34.35	2.2049	21 42 49.7	10.395	5	22 10 13.74	1.9247	11 51 23.1
6	20 33 46.44	2.1981	21 32 22.9	10.497	6	22 12 9.09	1.9203	11 37 37.3
7	20 35 58.12	2.1913	21 21 50.0	10.598	7	22 14 4.17	1.9158	11 23 49.1
8	20 38 9.40	2.1847	21 11 11.1	10.697	8	22 15 58.99	1.9114	11 9 58.7
9	20 40 20.28	2.1780	21 0 26.4	10.793	9	22 17 53.54	1.9072	10 56 6.1
10	20 42 30.76	2.1713	20 49 35.9	10.890	10	22 19 47.85	1.9031	10 42 11.4
11	20 44 40.83	2.1645	20 38 39.6	10.985	11	22 21 41.91	1.8989	10 28 14.6
12	20 46 50.50	2.1578	20 27 37.7	11.077	12	22 23 35.72	1.8948	10 14 15.9
13	20 48 59.77	2.1513	20 16 30.3	11.169	13	22 25 29.29	1.8908	10 0 15.3
14	20 51 8.65	2.1447	20 5 17.4	11.259	14	22 27 22.62	1.8869	9 46 12.8
15	20 53 17.13	2.1382	19 53 59.2	11.348	15	22 29 15.72	1.8831	9 32 8.5
16	20 55 25.23	2.1317	19 42 35.7	11.435	16	22 31 8.59	1.8793	9 18 2.5
17	20 57 32.93	2.1251	19 31 7.0	11.522	17	22 33 1.24	1.8756	9 3 54.9
18	20 59 40.24	2.1187	19 19 33.1	11.607	18	22 34 53.66	1.8719	8 49 45.6
19	21 1 47.17	2.1123	19 7 54.2	11.689	19	22 36 45.87	1.8684	8 35 34.8
20	21 3 53.71	2.1059	18 56 10.4	11.771	20	22 38 37.87	1.8649	8 21 22.5
21	21 5 59.88	2.0996	18 44 21.7	11.852	21	22 40 29.66	1.8614	8 7 8.8
22	21 8 5.66	2.0933	18 32 28.2	11.931	22	22 42 21.24	1.8581	7 52 53.8
23	21 10 11.07	2.0871	S. 18 20 30.0	12.009	23	22 44 12.63	1.8548	S. 7 38 37.5
	WEDNESDAY 2.					FRIDAY 4.		
0	21 12 16.11	2.0808	S. 18 8 27.1	12.086	0	22 46 3.82	1.8516	S. 7 24 19.9
1	21 14 20.77	2.0747	17 56 19.7	12.161	1	22 47 54.82	1.8484	7 10 1.1
2	21 16 25.07	2.0686	17 44 7.8	12.234	2	22 49 45.63	1.8453	6 55 41.3
3	21 18 29.00	2.0626	17 31 51.6	12.306	3	22 51 36.26	1.8423	6 41 20.4
4	21 20 32.58	2.0566	17 19 31.1	12.377	4	22 53 26.71	1.8394	6 26 58.5
5	21 22 35.79	2.0505	17 7 6.3	12.447	5	22 55 16.99	1.8366	6 12 35.7
6	21 24 38.64	2.0446	16 54 37.4	12.516	6	22 57 7.10	1.8338	5 58 12.0
7	21 26 41.14	2.0388	16 42 4.4	12.583	7	22 58 57.04	1.8310	5 43 47.5
8	21 28 43.29	2.0330	16 29 27.4	12.649	8	23 0 46.82	1.8283	5 29 22.2
9	21 30 45.10	2.0273	16 16 46.5	12.713	9	23 2 36.44	1.8258	5 14 56.2
10	21 32 46.56	2.0215	16 4 1.8	12.777	10	23 4 25.91	1.8233	5 0 29.6
11	21 34 47.68	2.0158	15 51 13.3	12.839	11	23 6 15.23	1.8208	4 46 2.4
12	21 36 48.46	2.0103	15 38 21.1	12.900	12	23 8 4.40	1.8183	4 31 34.6
13	21 38 48.91	2.0048	15 25 25.3	12.959	13	23 9 53.43	1.8161	4 17 6.4
14	21 40 49.03	1.9993	15 12 26.0	13.017	14	23 11 42.33	1.8139	4 2 37.7
15	21 42 48.83	1.9939	14 59 23.3	13.073	15	23 13 31.10	1.8118	3 48 8.7
16	21 44 48.30	1.9885	14 46 17.2	13.129	16	23 15 19.74	1.8096	3 33 39.4
17	21 46 47.45	1.9833	14 33 7.8	13.184	17	23 17 8.25	1.8076	3 19 9.8
18	21 48 46.29	1.9781	14 19 55.1	13.237	18	23 18 56.65	1.8057	3 4 40.0
19	21 50 44.82	1.9729	14 6 39.3	13.289	19	23 20 44.93	1.8038	2 50 10.1
20	21 52 43.04	1.9678	13 53 20.4	13.340	20	23 22 33.10	1.8019	2 35 40.1
21	21 54 40.95	1.9627	13 39 58.5	13.390	21	23 24 21.16	1.8002	2 21 9.9
22	21 56 38.56	1.9577	13 26 33.6	13.438	22	23 26 9.12	1.7985	2 6 39.8
23	21 58 35.87	1.9528	13 13 5.9	13.486	23	23 27 56.98	1.7969	1 52 9.8
24	22 0 32.89	1.9479	S. 12 59 35.3	13.532	24	23 29 44.75	1.7954	S. 1 37 39.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 5.					**MONDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 29 44.75	1.7954	S. 1 37 39.9	14.497	0	0 55 27.40	1.8015	N. 9 40 3.4	13.439
1	23 31 32.43	1.7939	1 23 10.1	14.494	1	0 57 15.54	1.8033	9 53 28.5	13.398
2	23 33 20.02	1.7925	1 8 40.6	14.490	2	0 59 3.79	1.8051	10 6 51.2	13.357
3	23 35 7.53	1.7912	0 54 11.3	14.486	3	1 0 52.15	1.8068	10 20 11.4	13.315
4	23 36 54.96	1.7899	0 39 42.3	14.480	4	1 2 40.61	1.8088	10 33 29.0	13.272
5	23 38 42.32	1.7888	0 25 13.7	14.473	5	1 4 29.20	1.8108	10 46 44.0	13.228
6	23 40 29.61	1.7877	S. 0 10 45.5	14.466	6	1 6 17.91	1.8128	10 59 56.4	13.184
7	23 42 16.84	1.7866	N. 0 3 42.2	14.457	7	1 8 6.74	1.8148	11 13 6.1	13.138
8	23 44 4.00	1.7856	0 18 9.4	14.448	8	1 9 55.69	1.8170	11 26 13.0	13.092
9	23 45 51.11	1.7847	0 32 36.0	14.438	9	1 11 44.78	1.8193	11 39 17.1	13.045
10	23 47 38.16	1.7838	0 47 2.0	14.428	10	1 13 34.00	1.8215	11 52 18.4	12.997
11	23 49 25.17	1.7832	1 1 27.4	14.417	11	1 15 23.36	1.8239	12 5 16.8	12.949
12	23 51 12.14	1.7824	1 15 52.0	14.404	12	1 17 12.87	1.8263	12 18 12.3	12.900
13	23 52 59.06	1.7818	1 30 15.9	14.391	13	1 19 2.52	1.8287	12 31 4.8	12.850
14	23 54 45.95	1.7813	1 44 38.9	14.377	14	1 20 52.31	1.8312	12 43 54.3	12.799
15	23 56 32.81	1.7807	1 59 1.1	14.362	15	1 22 42.26	1.8338	12 56 40.7	12.748
16	23 58 19.63	1.7803	2 13 22.4	14.347	16	1 24 32.36	1.8364	13 9 24.1	12.697
17	0 0 6.44	1.7799	2 27 42.7	14.331	17	1 26 22.63	1.8392	13 22 4.3	12.642
18	0 1 53.22	1.7796	2 42 2.1	14.314	18	1 28 13.06	1.8418	13 34 41.2	12.588
19	0 3 39.99	1.7793	2 56 20.4	14.295	19	1 30 3.65	1.8446	13 47 14.9	12.535
20	0 5 26.74	1.7792	3 10 37.5	14.276	20	1 31 54.41	1.8475	13 59 45.4	12.480
21	0 7 13.49	1.7791	3 24 53.5	14.257	21	1 33 45.35	1.8504	14 12 12.5	12.423
22	0 9 0.23	1.7791	3 39 8.4	14.237	22	1 35 36.46	1.8533	14 24 36.2	12.367
23	0 10 46.98	1.7792	N. 3 53 22.0	14.216	23	1 37 27.75	1.8563	N. 14 36 56.5	12.309
	SUNDAY 6.					**TUESDAY 8.**			
0	0 12 33.73	1.7793	N. 4 7 34.3	14.194	0	1 39 19.22	1.8594	N. 14 49 13.3	12.251
1	0 14 20.49	1.7794	4 21 45.3	14.172	1	1 41 10.88	1.8626	15 1 26.6	12.192
2	0 16 7.26	1.7797	4 35 54.9	14.148	2	1 43 2.73	1.8658	15 13 36.3	12.132
3	0 17 54.05	1.7800	4 50 3.1	14.123	3	1 44 54.77	1.8689	15 25 42.4	12.071
4	0 19 40.86	1.7803	5 4 9.7	14.098	4	1 46 47.00	1.8723	15 37 44.8	12.010
5	0 21 27.69	1.7808	5 18 14.9	14.073	5	1 48 39.44	1.8757	15 49 43.6	11.947
6	0 23 14.55	1.7813	5 32 18.5	14.047	6	1 50 32.08	1.8790	16 1 38.5	11.884
7	0 25 1.45	1.7819	5 46 20.5	14.019	7	1 52 24.92	1.8824	16 13 29.7	11.821
8	0 26 48.38	1.7825	6 0 20.8	13.992	8	1 54 17.97	1.8859	16 25 17.0	11.756
9	0 28 35.35	1.7832	6 14 19.5	13.963	9	1 56 11.23	1.8894	16 37 0.4	11.691
10	0 30 22.36	1.7839	6 28 16.4	13.933	10	1 58 4.70	1.8930	16 48 39.9	11.625
11	0 32 9.42	1.7848	6 42 11.5	13.902	11	1 59 58.39	1.8967	17 0 15.4	11.557
12	0 33 56.54	1.7858	6 56 4.7	13.872	12	2 1 52.30	1.9003	17 11 46.8	11.490
13	0 35 43.71	1.7867	7 9 56.1	13.840	13	2 3 46.43	1.9041	17 23 14.2	11.422
14	0 37 30.94	1.7878	7 23 45.5	13.807	14	2 5 40.79	1.9079	17 34 37.4	11.352
15	0 39 18.24	1.7888	7 37 32.9	13.773	15	2 7 35.38	1.9117	17 45 56.4	11.282
16	0 41 5.60	1.7899	7 51 18.3	13.740	16	2 9 30.19	1.9155	17 57 11.2	11.211
17	0 42 53.03	1.7912	8 5 1.7	13.705	17	2 11 25.24	1.9195	18 8 21.7	11.139
18	0 44 40.54	1.7925	8 18 42.9	13.669	18	2 13 20.53	1.9235	18 19 27.9	11.067
19	0 46 28.13	1.7938	8 32 22.0	13.633	19	2 15 16.06	1.9275	18 30 29.7	10.992
20	0 48 15.80	1.7953	8 45 58.9	13.596	20	2 17 11.83	1.9315	18 41 27.0	10.918
21	0 50 3.56	1.7968	8 59 33.5	13.557	21	2 19 7.84	1.9356	18 52 19.9	10.844
22	0 51 51.41	1.7983	9 13 5.8	13.519	22	2 21 4.10	1.9397	19 3 8.3	10.768
23	0 53 39.36	1.7999	9 26 35.8	13.480	23	2 23 0.60	1.9438	19 13 52.1	10.691
24	0 55 27.40	1.8015	N. 9 40 3.4	13.439	24	2 24 57.36	1.9481	N. 19 24 31.2	10.613

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 9.			
	h m s	s	° ′ ″	″
0	2 24 57.36	1.9481	N. 19 24 31.2	10.613
1	2 26 54.37	1.9523	19 35 5.7	10.535
2	2 28 51.64	1.9567	19 45 35.4	10.456
3	2 30 49.17	1.9609	19 56 0.4	10.376
4	2 32 46.95	1.9653	20 6 20.5	10.295
5	2 34 45.00	1.9698	20 16 35.8	10.214
6	2 36 43.32	1.9742	20 26 46.2	10.132
7	2 38 41.90	1.9786	20 36 51.6	10.047
8	2 40 40.75	1.9831	20 46 51.9	9.963
9	2 42 39.87	1.9877	20 56 47.1	9.877
10	2 44 39.27	1.9923	21 6 37.2	9.792
11	2 46 38.94	1.9968	21 16 22.2	9.706
12	2 48 38.89	2.0014	21 26 1.9	9.617
13	2 50 39.11	2.0061	21 35 36.3	9.529
14	2 52 39.62	2.0108	21 45 5.4	9.440
15	2 54 40.41	2.0155	21 54 29.1	9.350
16	2 56 41.48	2.0203	22 3 47.4	9.259
17	2 58 42.84	2.0249	22 13 0.2	9.167
18	3 0 44.47	2.0297	22 22 7.4	9.073
19	3 2 46.40	2.0346	22 31 9.0	8.980
20	3 4 48.62	2.0393	22 40 5.0	8.886
21	3 6 51.12	2.0441	22 48 55.3	8.790
22	3 8 53.91	2.0490	22 57 39.8	8.693
23	3 10 57.00	2.0539	N. 23 6 18.5	8.597
	THURSDAY 10.			
0	3 13 0.38	2.0588	N. 23 14 51.4	8.498
1	3 15 4.05	2.0636	23 23 18.3	8.399
2	3 17 8.01	2.0685	23 31 39.3	8.300
3	3 19 12.27	2.0735	23 39 54.3	8.199
4	3 21 16.83	2.0784	23 48 3.2	8.097
5	3 23 21.68	2.0833	23 56 6.0	7.995
6	3 25 26.83	2.0883	24 4 2.6	7.892
7	3 27 32.27	2.0932	24 11 53.0	7.787
8	3 29 38.01	2.0982	24 19 37.1	7.682
9	3 31 44.05	2.1032	24 27 14.8	7.576
10	3 33 50.39	2.1081	24 34 46.2	7.469
11	3 35 57.02	2.1130	24 42 11.1	7.362
12	3 38 3.95	2.1180	24 49 29.6	7.253
13	3 40 11.18	2.1229	24 56 41.5	7.143
14	3 42 18.70	2.1278	25 3 46.8	7.032
15	3 44 26.52	2.1328	25 10 45.4	6.921
16	3 46 34.64	2.1378	25 17 37.3	6.809
17	3 48 43.05	2.1427	25 24 22.5	6.697
18	3 50 51.76	2.1476	25 31 0.9	6.582
19	3 53 0.76	2.1524	25 37 32.4	6.467
20	3 55 10.05	2.1573	25 43 57.0	6.352
21	3 57 19.64	2.1623	25 50 14.6	6.236
22	3 59 29.53	2.1672	25 56 25.3	6.118
23	4 1 39.70	2.1719	26 2 28.8	5.999
24	4 3 50.16	2.1768	N. 26 8 25.2	5.880

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 11.			
	h m s	s	° ′ ″	″
0	4 3 50.16	2.1768	N. 26 8 25.2	5.88
1	4 6 0.91	2.1816	26 14 14.4	5.76
2	4 8 11.95	2.1863	26 19 56.4	5.63
3	4 10 23.27	2.1910	26 25 31.1	5.51
4	4 12 34.87	2.1958	26 30 58.6	5.39
5	4 14 46.76	2.2004	26 36 18.6	5.27
6	4 16 58.92	2.2050	26 41 31.2	5.14
7	4 19 11.36	2.2097	26 46 36.3	5.02
8	4 21 24.08	2.2143	26 51 33.9	4.89
9	4 23 37.07	2.2188	26 56 23.9	4.76
10	4 25 50.34	2.2233	27 1 6.2	4.64
11	4 28 3.87	2.2278	27 5 40.9	4.51
12	4 30 17.67	2.2323	27 10 7.9	4.38
13	4 32 31.74	2.2366	27 14 27.1	4.25
14	4 34 46.06	2.2409	27 18 38.5	4.12
15	4 37 0.65	2.2453	27 22 42.0	3.99
16	4 39 15.49	2.2495	27 26 37.6	3.86
17	4 41 30.59	2.2537	27 30 25.2	3.72
18	4 43 45.94	2.2578	27 34 4.8	3.59
19	4 46 1.53	2.2619	27 37 36.3	3.458
20	4 48 17.37	2.2660	27 40 59.8	3.323
21	4 50 33.45	2.2700	27 44 15.1	3.187
22	4 52 49.77	2.2739	27 47 22.2	3.050
23	4 55 6.32	2.2778	N. 27 50 21.1	2.912
	SATURDAY 12.			
0	4 57 23.10	2.2816	N. 27 53 11.7	2.774
1	4 59 40.11	2.2853	27 55 54.0	2.635
2	5 1 57.34	2.2890	27 58 27.9	2.495
3	5 4 14.79	2.2927	28 0 53.4	2.355
4	5 6 32.46	2.2963	28 3 10.5	2.214
5	5 8 50.34	2.2997	28 5 19.1	2.072
6	5 11 8.42	2.3031	28 7 19.2	1.930
7	5 13 26.71	2.3065	28 9 10.7	1.787
8	5 15 45.20	2.3098	28 10 53.6	1.644
9	5 18 3.88	2.3129	28 12 28.0	1.500
10	5 20 22.75	2.3161	28 13 53.6	1.354
11	5 22 41.81	2.3192	28 15 10.5	1.209
12	5 25 1.05	2.3222	28 16 18.7	1.063
13	5 27 20.47	2.3250	28 17 18.1	0.917
14	5 29 40.05	2.3278	28 18 8.7	0.770
15	5 31 59.81	2.3307	28 18 50.5	0.622
16	5 34 19.73	2.3333	28 19 23.4	0.474
17	5 36 39.81	2.3359	28 19 47.4	0.326
18	5 39 0.04	2.3384	28 20 2.5	0.177
19	5 41 20.42	2.3408	28 20 8.6	+0.027
20	5 43 40.94	2.3432	28 20 5.7	−0.123
21	5 46 1.60	2.3454	28 19 53.8	0.273
22	5 48 22.39	2.3476	28 19 32.9	0.424
23	5 50 43.31	2.3497	28 19 2.9	0.576
24	5 53 4.35	2.3517	N. 28 18 23.8	0.727

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 13.					**TUESDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 53 4.35	2.3517	N. 28 18 23.8	0.727	0	7 46 36.04	2.3476	N. 24 45 37.0	8.111
1	5 55 25.51	2.3536	28 17 35.6	0.879	1	7 48 56.84	2.3457	24 37 25.9	8.259
2	5 57 46.78	2.3554	28 16 38.3	1.032	2	7 51 17.52	2.3437	24 29 5.9	8.407
3	6 0 8.16	2.3572	28 15 31.8	1.185	3	7 53 38.08	2.3417	24 20 37.1	8.553
4	6 2 29.64	2.3588	28 14 16.1	1.337	4	7 55 58.52	2.3397	24 11 59.5	8.700
5	6 4 51.21	2.3603	28 12 51.3	1.491	5	7 58 18.84	2.3376	24 3 13.1	8.846
6	6 7 12.88	2.3618	28 11 17.2	1.645	6	8 0 39.03	2.3355	23 54 18.0	8.991
7	6 9 34.63	2.3632	28 9 33.9	1.799	7	8 2 59.10	2.3333	23 45 14.2	9.136
8	6 11 56.46	2.3645	28 7 41.3	1.953	8	8 5 19.03	2.3311	23 36 1.7	9.280
9	6 14 18.37	2.3658	28 5 39.5	2.107	9	8 7 38.83	2.3289	23 26 40.6	9.422
10	6 16 40.35	2.3668	28 3 28.4	2.262	10	8 9 58.50	2.3267	23 17 11.0	9.565
11	6 19 2.39	2.3678	28 1 8.1	2.417	11	8 12 18.03	2.3243	23 7 32.8	9.707
12	6 21 24.49	2.3688	27 58 38.4	2.572	12	8 14 37.42	2.3220	22 57 46.2	9.847
13	6 23 46.64	2.3696	27 55 59.4	2.727	13	8 16 56.67	2.3197	22 47 51.2	9.987
14	6 26 8.84	2.3704	27 53 11.1	2.882	14	8 19 15.78	2.3173	22 37 47.7	10.127
15	6 28 31.09	2.3711	27 50 13.5	3.037	15	8 21 34.74	2.3148	22 27 35.9	10.266
16	6 30 53.37	2.3716	27 47 6.6	3.193	16	8 23 53.55	2.3123	22 17 15.8	10.403
17	6 33 15.68	2.3721	27 43 50.3	3.349	17	8 26 12.21	2.3098	22 6 47.5	10.540
18	6 35 38.02	2.3725	27 40 24.7	3.505	18	8 28 30.73	2.3073	21 56 11.0	10.677
19	6 38 0.38	2.3728	27 36 49.7	3.661	19	8 30 49.09	2.3048	21 45 26.3	10.812
20	6 40 22.76	2.3731	27 33 5.4	3.816	20	8 33 7.31	2.3023	21 34 33.5	10.947
21	6 42 45.15	2.3732	27 29 11.8	3.972	21	8 35 25.37	2.2998	21 23 32.7	11.080
22	6 45 7.54	2.3733	27 25 8.8	4.128	22	8 37 43.28	2.2972	21 12 23.9	11.212
23	6 47 29.94	2.3733	N. 27 20 56.4	4.284	23	8 40 1.03	2.2946	N. 21 1 7.2	11.344
	MONDAY 14.					**WEDNESDAY 16.**			
0	6 49 52.33	2.3731	N. 27 16 34.7	4.440	0	8 42 18.63	2.2920	N. 20 49 42.6	11.475
1	6 52 14.71	2.3728	27 12 3.6	4.596	1	8 44 36.07	2.2893	20 38 10.2	11.604
2	6 54 37.07	2.3726	27 7 23.2	4.751	2	8 46 53.35	2.2868	20 26 30.1	11.733
3	6 56 59.42	2.3723	27 2 33.5	4.907	3	8 49 10.48	2.2842	20 14 42.2	11.862
4	6 59 21.74	2.3718	26 57 34.4	5.062	4	8 51 27.45	2.2815	20 2 46.7	11.988
5	7 1 44.03	2.3713	26 52 26.1	5.217	5	8 53 44.26	2.2789	19 50 43.7	12.113
6	7 4 6.29	2.3707	26 47 8.4	5.372	6	8 56 0.92	2.2763	19 38 33.1	12.238
7	7 6 28.51	2.3699	26 41 41.4	5.527	7	8 58 17.42	2.2737	19 26 15.1	12.362
8	7 8 50.68	2.3692	26 36 5.2	5.681	8	9 0 33.76	2.2710	19 13 49.6	12.486
9	7 11 12.81	2.3683	26 30 19.7	5.836	9	9 2 49.94	2.2684	19 1 16.8	12.607
10	7 13 34.88	2.3674	26 24 24.9	5.990	10	9 5 5.97	2.2658	18 48 36.8	12.727
11	7 15 56.90	2.3665	26 18 20.9	6.143	11	9 7 21.84	2.2633	18 35 49.6	12.847
12	7 18 18.86	2.3654	26 12 7.7	6.297	12	9 9 37.56	2.2607	18 22 55.2	12.965
13	7 20 40.75	2.3643	26 5 45.2	6.451	13	9 11 53.12	2.2581	18 9 53.8	13.082
14	7 23 2.57	2.3630	25 59 13.6	6.603	14	9 14 8.53	2.2555	17 56 45.4	13.198
15	7 25 24.31	2.3618	25 52 32.8	6.757	15	9 16 23.78	2.2529	17 43 30.0	13.313
16	7 27 45.98	2.3604	25 45 42.8	6.908	16	9 18 38.88	2.2505	17 30 7.8	13.426
17	7 30 7.56	2.3590	25 38 43.8	7.060	17	9 20 53.84	2.2480	17 16 38.9	13.538
18	7 32 29.06	2.3576	25 31 35.6	7.212	18	9 23 8.64	2.2454	17 3 3.2	13.650
19	7 34 50.47	2.3561	25 24 18.4	7.362	19	9 25 23.29	2.2430	16 49 20.9	13.760
20	7 37 11.79	2.3544	25 16 52.1	7.513	20	9 27 37.80	2.2406	16 35 32.0	13.869
21	7 39 33.00	2.3528	25 9 16.8	7.663	21	9 29 52.16	2.2382	16 21 36.6	13.977
22	7 41 54.12	2.3511	25 1 32.5	7.813	22	9 32 6.38	2.2358	16 7 34.8	14.082
23	7 44 15.13	2.3493	24 53 39.2	7.962	23	9 34 20.46	2.2334	15 53 26.7	14.187
24	7 46 36.04	2.3476	N. 24 45 37.0	8.111	24	9 36 34.39	2.2311	N. 15 39 12.3	14.292

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 17.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	9 36 34.39	2.2311	N. 15 39 12.3	14.292
1	9 38 48.19	2.2288	15 24 51.7	14.393
2	9 41 1.85	2.2266	15 10 25.1	14.494
3	9 43 15.38	2.2243	14 55 52.4	14.594
4	9 45 28.77	2.2221	14 41 13.8	14.692
5	9 47 42.03	2.2200	14 26 29.3	14.790
6	9 49 55.17	2.2179	14 11 39.0	14.886
7	9 52 8.18	2.2158	13 56 43.0	14.980
8	9 54 21.06	2.2138	13 41 41.4	15.072
9	9 56 33.83	2.2118	13 26 34.3	15.164
10	9 58 46.48	2.2098	13 11 21.7	15.254
11	10 0 59.01	2.2079	12 56 3.8	15.342
12	10 3 11.43	2.2061	12 40 40.6	15.430
13	10 5 23.74	2.2043	12 25 12.2	15.516
14	10 7 35.94	2.2026	12 9 38.7	15.600
15	10 9 48.05	2.2009	11 54 0.2	15.682
16	10 12 0.05	2.1992	11 38 16.8	15.763
17	10 14 11.95	2.1976	11 22 28.6	15.843
18	10 16 23.76	2.1961	11 6 35.6	15.922
19	10 18 35.48	2.1946	10 50 38.0	15.998
20	10 20 47.11	2.1931	10 34 35.8	16.073
21	10 22 58.65	2.1917	10 18 29.2	16.147
22	10 25 10.11	2.1904	10 2 18.2	16.219
23	10 27 21.50	2.1892	N. 9 46 2.9	16.290

FRIDAY 18.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	10 29 32.81	2.1879	N. 9 29 43.4	16.359
1	10 31 44.05	2.1868	9 13 19.8	16.426
2	10 33 55.23	2.1858	8 56 52.3	16.491
3	10 36 6.34	2.1847	8 40 20.9	16.555
4	10 38 17.39	2.1838	8 23 45.7	16.617
5	10 40 28.39	2.1829	8 7 6.8	16.678
6	10 42 39.34	2.1820	7 50 24.3	16.737
7	10 44 50.23	2.1813	7 33 38.3	16.796
8	10 47 1.09	2.1806	7 16 48.8	16.852
9	10 49 11.90	2.1799	6 59 56.1	16.905
10	10 51 22.68	2.1794	6 43 0.2	16.957
11	10 53 33.43	2.1789	6 26 1.2	17.008
12	10 55 44.15	2.1785	6 8 59.2	17.057
13	10 57 54.85	2.1782	5 51 54.3	17.105
14	11 0 5.53	2.1778	5 34 46.6	17.150
15	11 2 16.19	2.1777	5 17 36.3	17.193
16	11 4 26.85	2.1776	5 0 23.4	17.236
17	11 6 37.50	2.1775	4 43 8.0	17.277
18	11 8 48.15	2.1775	4 25 50.2	17.315
19	11 10 58.80	2.1776	4 8 30.2	17.352
20	11 13 9.46	2.1778	3 51 8.0	17.387
21	11 15 20.13	2.1780	3 33 43.8	17.419
22	11 17 30.82	2.1783	3 16 17.7	17.451
23	11 19 41.53	2.1787	2 58 49.7	17.481
24	11 21 52.26	2.1791	N. 2 41 20.0	17.508

SATURDAY 19.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	11 21 52.26	2.1791	N. 2 41 20.0	17.508
1	11 24 3.02	2.1797	2 23 48.7	17.534
2	11 26 13.82	2.1803	2 6 15.9	17.557
3	11 28 24.66	2.1810	1 48 41.8	17.580
4	11 30 35.54	2.1818	1 31 6.3	17.601
5	11 32 46.47	2.1826	1 13 29.7	17.619
6	11 34 57.45	2.1835	0 55 52.0	17.636
7	11 37 8.49	2.1845	0 38 13.4	17.650
8	11 39 19.59	2.1856	0 20 34.0	17.662
9	11 41 30.76	2.1868	N. 0 2 53.9	17.674
10	11 43 42.00	2.1880	S. 0 14 46.9	17.683
11	11 45 53.32	2.1893	0 32 28.1	17.690
12	11 48 4.72	2.1908	0 50 9.7	17.695
13	11 50 16.21	2.1923	1 7 51.5	17.698
14	11 52 27.79	2.1938	1 25 33.5	17.700
15	11 54 39.46	2.1953	1 43 15.5	17.699
16	11 56 51.23	2.1971	2 0 57.4	17.697
17	11 59 3.11	2.1989	2 18 39.1	17.692
18	12 1 15.10	2.2008	2 36 20.4	17.685
19	12 3 27.20	2.2027	2 54 1.3	17.677
20	12 5 39.42	2.2048	3 11 41.6	17.666
21	12 7 51.77	2.2068	3 29 21.2	17.653
22	12 10 4.24	2.2090	3 47 0.0	17.639
23	12 12 16.85	2.2113	S. 4 4 37.9	17.622

SUNDAY 20.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	12 14 29.59	2.2136	S. 4 22 14.7	17.604
1	12 16 42.48	2.2161	4 39 50.4	17.584
2	12 18 55.52	2.2185	4 57 24.8	17.561
3	12 21 8.70	2.2210	5 14 57.7	17.537
4	12 23 22.04	2.2238	5 32 29.2	17.511
5	12 25 35.55	2.2265	5 49 59.0	17.483
6	12 27 49.22	2.2293	6 7 27.1	17.452
7	12 30 3.06	2.2321	6 24 53.2	17.418
8	12 32 17.07	2.2351	6 42 17.3	17.384
9	12 34 31.27	2.2382	6 59 39.3	17.347
10	12 36 45.65	2.2412	7 16 59.0	17.309
11	12 39 0.21	2.2443	7 34 16.4	17.269
12	12 41 14.97	2.2477	7 51 31.3	17.226
13	12 43 29.93	2.2509	8 8 43.5	17.181
14	12 45 45.08	2.2543	8 25 53.0	17.135
15	12 48 0.44	2.2578	8 42 59.7	17.086
16	12 50 16.01	2.2613	9 0 3.3	17.035
17	12 52 31.79	2.2648	9 17 3.9	16.982
18	12 54 47.79	2.2685	9 34 1.2	16.927
19	12 57 4.01	2.2723	9 50 55.1	16.870
20	12 59 20.46	2.2761	10 7 45.6	16.812
21	13 1 37.14	2.2799	10 24 32.5	16.750
22	13 3 54.05	2.2838	10 41 15.6	16.687
23	13 6 11.19	2.2878	10 57 54.9	16.622
24	13 8 28.58	2.2918	S. 11 14 30.3	16.556

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 21.					**WEDNESDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 8 28.58	2.2918	S. 11 14 30.3	16.556	0	15 3 54.48	2.5233	S. 22 34 8.8	11.047
1	13 10 46.21	2.2959	11 31 1.6	16.486	1	15 6 26.02	2.5280	22 45 6.9	10.889
2	13 13 4.09	2.3001	11 47 28.6	16.414	2	15 8 57.84	2.5325	22 55 55.5	10.730
3	13 15 22.22	2.3043	12 3 51.3	16.342	3	15 11 29.92	2.5370	23 6 34.5	10.570
4	13 17 40.60	2.3086	12 20 9.6	16.266	4	15 14 2.28	2.5416	23 17 3.9	10.408
5	13 19 59.25	2.3129	12 36 23.2	16.188	5	15 16 34.91	2.5460	23 27 23.5	10.244
6	13 22 18.15	2.3173	12 52 32.2	16.109	6	15 19 7.80	2.5503	23 37 33.2	10.079
7	13 24 37.32	2.3218	13 8 36.3	16.027	7	15 21 40.95	2.5546	23 47 33.0	9.914
8	13 26 56.76	2.3263	13 24 35.5	15.944	8	15 24 14.35	2.5588	23 57 22.9	9.747
9	13 29 16.47	2.3308	13 40 29.6	15.858	9	15 26 48.00	2.5629	24 7 2.7	9.578
10	13 31 36.45	2.3353	13 56 18.5	15.771	10	15 29 21.90	2.5670	24 16 32.3	9.408
11	13 33 56.71	2.3399	14 12 2.1	15.682	11	15 31 56.04	2.5709	24 25 51.7	9.238
12	13 36 17.24	2.3446	14 27 40.3	15.590	12	15 34 30.41	2.5748	24 35 0.9	9.067
13	13 38 38.06	2.3493	14 43 12.9	15.497	13	15 37 5.01	2.5786	24 43 59.7	8.893
14	13 40 59.16	2.3541	14 58 39.9	15.402	14	15 39 39.84	2.5823	24 52 48.0	8.718
15	13 43 20.55	2.3588	15 14 1.1	15.304	15	15 42 14.88	2.5858	25 1 25.9	8.543
16	13 45 42.22	2.3637	15 29 16.4	15.204	16	15 44 50.14	2.5893	25 9 53.2	8.366
17	13 48 4.19	2.3686	15 44 25.6	15.102	17	15 47 25.60	2.5927	25 18 9.8	8.188
18	13 50 26.45	2.3734	15 59 28.7	14.999	18	15 50 1.26	2.5959	25 26 15.8	8.011
19	13 52 49.00	2.3783	16 14 25.5	14.894	19	15 52 37.11	2.5992	25 34 11.1	7.831
20	13 55 11.85	2.3833	16 29 16.0	14.787	20	15 55 13.16	2.6023	25 41 55.5	7.650
21	13 57 35.00	2.3883	16 44 0.0	14.678	21	15 57 49.39	2.6053	25 49 29.1	7.470
22	13 59 58.44	2.3933	16 58 37.4	14.567	22	16 0 25.79	2.6080	25 56 51.9	7.288
23	14 2 22.19	2.3983	S. 17 13 8.1	14.454	23	16 3 2.35	2.6108	S. 26 4 3.7	7.104
	TUESDAY 22.					**THURSDAY 24.**			
0	14 4 46.24	2.4033	S. 17 27 31.9	14.339	0	16 5 39.08	2.6134	S. 26 11 4.4	6.920
1	14 7 10.59	2.4084	17 41 48.8	14.222	1	16 8 15.96	2.6159	26 17 54.1	6.736
2	14 9 35.25	2.4135	17 55 58.6	14.103	2	16 10 52.99	2.6183	26 24 32.7	6.551
3	14 12 0.21	2.4185	18 10 1.2	13.983	3	16 13 30.15	2.6204	26 31 0.2	6.366
4	14 14 25.47	2.4236	18 23 56.6	13.861	4	16 16 7.44	2.6226	26 37 16.6	6.179
5	14 16 51.04	2.4288	18 37 44.5	13.737	5	16 18 44.86	2.6246	26 43 21.7	5.992
6	14 19 16.92	2.4338	18 51 25.0	13.611	6	16 21 22.39	2.6263	26 49 15.6	5.804
7	14 21 43.10	2.4389	19 4 57.8	13.483	7	16 24 0.02	2.6280	26 54 58.2	5.616
8	14 24 9.59	2.4441	19 18 22.9	13.354	8	16 26 37.75	2.6296	27 0 29.5	5.427
9	14 26 36.39	2.4492	19 31 40.2	13.222	9	16 29 15.57	2.6310	27 5 49.5	5.239
10	14 29 3.49	2.4543	19 44 49.6	13.089	10	16 31 53.47	2.6323	27 10 58.2	5.050
11	14 31 30.90	2.4594	19 57 50.9	12.953	11	16 34 31.45	2.6335	27 15 55.5	4.859
12	14 33 58.62	2.4645	20 10 44.0	12.816	12	16 37 9.49	2.6344	27 20 41.3	4.668
13	14 36 26.64	2.4695	20 23 28.8	12.677	13	16 39 47.58	2.6353	27 25 15.7	4.478
14	14 38 54.96	2.4745	20 36 5.3	12.538	14	16 42 25.72	2.6360	27 29 38.7	4.287
15	14 41 23.58	2.4795	20 48 33.4	12.397	15	16 45 3.90	2.6366	27 33 50.2	4.097
16	14 43 52.50	2.4845	21 0 52.9	12.252	16	16 47 42.11	2.6369	27 37 50.3	3.906
17	14 46 21.72	2.4895	21 13 3.7	12.107	17	16 50 20.33	2.6372	27 41 38.9	3.714
18	14 48 51.24	2.4944	21 25 5.7	11.960	18	16 52 58.57	2.6373	27 45 16.0	3.523
19	14 51 21.05	2.4993	21 36 58.9	11.812	19	16 55 36.80	2.6372	27 48 41.7	3.332
20	14 53 51.16	2.5043	21 48 43.1	11.662	20	16 58 15.03	2.6370	27 51 55.8	3.140
21	14 56 21.56	2.5091	22 0 18.3	11.511	21	17 0 53.24	2.6366	27 54 58.5	2.949
22	14 58 52.25	2.5138	22 11 44.4	11.358	22	17 3 31.42	2.6361	27 57 49.7	2.757
23	15 1 23.22	2.5186	22 23 1.3	11.203	23	17 6 9.57	2.6355	28 0 29.4	2.566
24	15 3 54.48	2.5233	S. 22 34 8.8	11.047	24	17 8 47.68	2.6346	S. 28 2 57.6	2.374

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 25.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	17 8 47.68	2.6346	S. 28 2 57.6	2.374
1	17 11 25.72	2.6335	28 5 14.3	2.183
2	17 14 3.70	2.6324	28 7 19.6	1.992
3	17 16 41.61	2.6311	28 9 13.4	1.802
4	17 19 19.43	2.6296	28 10 55.9	1.612
5	17 21 57.16	2.6280	28 12 26.9	1.422
6	17 24 34.79	2.6263	28 13 46.5	1.232
7	17 27 12.31	2.6243	28 14 54.7	1.042
8	17 29 49.71	2.6223	28 15 51.6	0.854
9	17 32 26.98	2.6200	28 16 37.2	0.666
10	17 35 4.11	2.6177	28 17 11.5	0.477
11	17 37 41.10	2.6152	28 17 34.5	0.290
12	17 40 17.93	2.6124	28 17 46.3	−0.103
13	17 42 54.59	2.6095	28 17 46.9	+0.083
14	17 45 31.07	2.6065	28 17 36.3	0.269
15	17 48 7.37	2.6034	28 17 14.6	0.453
16	17 50 43.48	2.6002	28 16 41.9	0.637
17	17 53 19.40	2.5968	28 15 58.1	0.822
18	17 55 55.10	2.5933	28 15 3.3	1.004
19	17 58 30.59	2.5896	28 13 57.6	1.187
20	18 1 5.85	2.5858	28 12 40.9	1.368
21	18 3 40.88	2.5818	28 11 13.4	1.548
22	18 6 15.67	2.5778	28 9 35.1	1.727
23	18 8 50.21	2.5735	S. 28 7 46.1	1.906

SATURDAY 26.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	18 11 24.49	2.5692	S. 28 5 46.4	2.084
1	18 13 58.51	2.5647	28 3 36.0	2.261
2	18 16 32.25	2.5600	28 1 15.1	2.436
3	18 19 5.71	2.5553	27 58 43.7	2.611
4	18 21 38.88	2.5504	27 56 1.8	2.785
5	18 24 11.76	2.5455	27 53 9.5	2.957
6	18 26 44.34	2.5404	27 50 6.9	3.129
7	18 29 16.61	2.5352	27 46 54.0	3.300
8	18 31 48.56	2.5299	27 43 30.9	3.469
9	18 34 20.20	2.5246	27 39 57.7	3.637
10	18 36 51.51	2.5191	27 36 14.4	3.805
11	18 39 22.49	2.5134	27 32 21.1	3.971
12	18 41 53.12	2.5077	27 28 17.9	4.136
13	18 44 23.41	2.5019	27 24 4.8	4.299
14	18 46 53.35	2.4960	27 19 42.0	4.461
15	18 49 22.93	2.4900	27 15 9.5	4.622
16	18 51 52.15	2.4839	27 10 27.4	4.782
17	18 54 21.00	2.4778	27 5 35.7	4.941
18	18 56 49.49	2.4717	27 0 34.5	5.098
19	18 59 17.60	2.4653	26 55 23.9	5.253
20	19 1 45.33	2.4589	26 50 4.1	5.407
21	19 4 12.67	2.4525	26 44 35.0	5.562
22	19 6 39.63	2.4460	26 38 56.7	5.713
23	19 9 6.19	2.4394	26 33 9.4	5.863
24	19 11 32.36	2.4328	S. 26 27 13.1	6.012

SUNDAY 27.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	19 11 32.36	2.4328	S. 26 27 13.1	6.012
1	19 13 58.13	2.4261	26 21 7.9	6.160
2	19 16 23.49	2.4193	26 14 53.9	6.307
3	19 18 48.45	2.4125	26 8 31.1	6.452
4	19 21 12.99	2.4057	26 1 59.7	6.595
5	19 23 37.13	2.3988	25 55 19.7	6.737
6	19 26 0.85	2.3918	25 48 31.2	6.878
7	19 28 24.15	2.3848	25 41 34.3	7.017
8	19 30 47.03	2.3778	25 34 29.1	7.155
9	19 33 9.49	2.3708	25 27 15.7	7.292
10	19 35 31.53	2.3638	25 19 54.1	7.427
11	19 37 53.14	2.3567	25 12 24.5	7.560
12	19 40 14.33	2.3496	25 4 46.9	7.692
13	19 42 35.09	2.3423	24 57 1.5	7.822
14	19 44 55.41	2.3351	24 49 8.2	7.952
15	19 47 15.30	2.3279	24 41 7.2	8.080
16	19 49 34.76	2.3208	24 32 58.6	8.206
17	19 51 53.79	2.3135	24 24 42.5	8.330
18	19 54 12.38	2.3063	24 16 19.0	8.453
19	19 56 30.54	2.2991	24 7 48.1	8.576
20	19 58 48.27	2.2918	23 59 9.9	8.697
21	20 1 5.56	2.2845	23 50 24.5	8.815
22	20 3 22.41	2.2773	23 41 32.1	8.932
23	20 5 38.83	2.2701	S. 23 32 32.6	9.048

MONDAY 28.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	20 7 54.82	2.2628	S. 23 23 26.3	9.162
1	20 10 10.37	2.2556	23 14 13.1	9.276
2	20 12 25.49	2.2484	23 4 53.2	9.387
3	20 14 40.18	2.2412	22 55 26.6	9.497
4	20 16 54.43	2.2339	22 45 53.5	9.607
5	20 19 8.25	2.2268	22 36 13.8	9.714
6	20 21 21.64	2.2197	22 26 27.8	9.820
7	20 23 34.61	2.2125	22 16 35.4	9.924
8	20 25 47.14	2.2053	22 6 36.9	10.027
9	20 27 59.25	2.1983	21 56 32.2	10.129
10	20 30 10.93	2.1912	21 46 21.4	10.230
11	20 32 22.19	2.1842	21 36 4.6	10.328
12	20 34 33.03	2.1772	21 25 42.0	10.425
13	20 36 43.45	2.1702	21 15 13.6	10.522
14	20 38 53.45	2.1632	21 4 39.4	10.617
15	20 41 3.03	2.1563	20 53 59.6	10.709
16	20 43 12.20	2.1494	20 43 14.3	10.801
17	20 45 20.96	2.1426	20 32 23.5	10.892
18	20 47 29.31	2.1358	20 21 27.2	10.982
19	20 49 37.25	2.1290	20 10 25.7	11.068
20	20 51 44.79	2.1223	19 59 19.0	11.155
21	20 53 51.93	2.1157	19 48 7.1	11.240
22	20 55 58.67	2.1091	19 36 50.2	11.323
23	20 58 5.02	2.1025	19 25 28.3	11.407
24	21 0 10.97	2.0959	S. 19 14 1.4	11.487

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	21 0 10.97	2.0959	S. 19 14 1.4	11.487
1	21 2 16.53	2.0894	19 2 29.8	11.567
2	21 4 21.70	2.0830	18 50 53.4	11.646
3	21 6 26.49	2.0766	18 39 12.3	11.722
4	21 8 30.89	2.0703	18 27 26.7	11.798
5	21 10 34.92	2.0640	18 15 36.5	11.872
6	21 12 38.57	2.0578	18 3 42.0	11.945
7	21 14 41.85	2.0517	17 51 43.1	12.018
8	21 16 44.77	2.0456	17 39 39.8	12.089
9	21 18 47.32	2.0395	17 27 32.4	12.158
10	21 20 49.51	2.0335	17 15 20.8	12.227
11	21 22 51.34	2.0275	17 3 5.2	12.293
12	21 24 52.81	2.0216	16 50 45.6	12.359
13	21 26 53.93	2.0158	16 38 22.1	12.423
14	21 28 54.71	2.0101	16 25 54.8	12.487
15	21 30 55.14	2.0044	16 13 23.6	12.550
16	21 32 55.24	1.9988	16 0 48.8	12.610
17	21 34 55.00	1.9932	15 48 10.4	12.670
18	21 36 54.42	1.9876	15 35 28.4	12.728
19	21 38 53.51	1.9822	15 22 43.0	12.786
20	21 40 52.28	1.9768	15 9 54.1	12.842
21	21 42 50.73	1.9716	14 57 1.9	12.897
22	21 44 48.87	1.9663	14 44 6.4	12.952
23	21 46 46.69	1.9611	S. 14 31 7.7	13.004

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	21 48 44.20	1.9560	S. 14 18 5.9	13.056
1	21 50 41.41	1.9510	14 5 1.0	13.107
2	21 52 38.32	1.9460	13 51 53.1	13.156
3	21 54 34.93	1.9411	13 38 42.3	13.204
4	21 56 31.25	1.9363	13 25 28.6	13.252
5	21 58 27.28	1.9314	13 12 12.1	13.297
6	22 0 23.02	1.9268	12 58 52.9	13.342
7	22 2 18.49	1.9222	12 45 31.0	13.387
8	22 4 13.68	1.9176	12 32 6.5	13.429
9	22 6 8.60	1.9131	12 18 39.5	13.471
10	22 8 3.25	1.9087	12 5 10.0	13.512
11	22 9 57.64	1.9043	11 51 38.0	13.552
12	22 11 51.76	1.8999	11 38 3.7	13.591
13	22 13 45.63	1.8958	11 24 27.1	13.628
14	22 15 39.26	1.8917	11 10 48.3	13.665
15	22 17 32.63	1.8875	10 57 7.3	13.701
16	22 19 25.76	1.8836	10 43 24.2	13.735
17	22 21 18.66	1.8797	10 29 39.1	13.768
18	22 23 11.32	1.8758	10 15 52.0	13.802
19	22 25 3.76	1.8720	10 2 2.9	13.833
20	22 26 55.96	1.8683	9 48 12.0	13.863
21	22 28 47.95	1.8647	9 34 19.3	13.893
22	22 30 39.72	1.8611	9 20 24.8	13.922
23	22 32 31.28	1.8576	9 6 28.7	13.949
24	22 34 22.63	1.8542	S. 8 52 30.9	13.977

THURSDAY, OCTOBER 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	22 34 22.63	1.8542	S. 8 52 30.9	13.977

PHASES OF THE MOON.

			d	h	m
○	Full Moon	. . . . Sept.	4	2	1.2
☾	Last Quarter	. . . .	12	5	48.3
●	New Moon	. . . .	19	9	33.3
☽	First Quarter	. . . .	26	0	3.0

			d	h
☾	Apogee	. . . . Sept.	8	15.7
☾	Perigee	. . . .	20	18.5

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.	Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	12 27 22.67	9.044	S. 2 57 34.9	–58.26	16 0.66	64.29	10 5.66	0.810
Frid.	2	12 30 59.86	9.056	3 20 52.6	58.18	16 0.94	64.33	10 24.97	0.798
Sat.	3	12 34 37.35	9.068	3 44 7.8	58.08	16 1.22	64.38	10 43.99	0.785
SUN.	4	12 38 15.15	9.082	4 7 20.5	–57.97	16 1.50	64.43	11 2.69	0.772
Mon.	5	12 41 53.28	9.097	4 30 30.3	57.84	16 1.77	64.48	11 21.06	0.757
Tues.	6	12 45 31.78	9.113	4 53 37.0	57.70	16 2.05	64.53	11 39.06	0.742
Wed.	7	12 49 10.67	9.129	5 16 40.1	–57.55	16 2.32	64.59	11 56.68	0.726
Thur.	8	12 52 49.96	9.146	5 39 39.3	57.38	16 2.59	64.65	12 13.90	0.708
Frid.	9	12 56 29.68	9.164	6 2 34.1	57.19	16 2.86	64.71	12 30.68	0.690
Sat.	10	13 0 9.85	9.183	6 25 24.3	–56.99	16 3.13	64.78	12 47.02	0.671
SUN.	11	13 3 50.49	9.204	6 48 9.6	56.77	16 3.40	64.85	13 2.89	0.651
Mon.	12	13 7 31.62	9.225	7 10 49.6	56.54	16 3.67	64.92	13 18.27	0.630
Tues.	13	13 11 13.27	9.247	7 33 23.8	–56.29	16 3.94	64.99	13 33.14	0.608
Wed.	14	13 14 55.45	9.269	7 55 51.9	56.03	16 4.21	65.07	13 47.48	0.586
Thur.	15	13 18 38.18	9.292	8 18 13.5	55.75	16 4.48	65.15	14 1.27	0.563
Frid.	16	13 22 21.47	9.316	8 40 28.3	–55.46	16 4.75	65.23	14 14.49	0.539
Sat.	17	13 26 5.34	9.340	9 2 35.8	55.15	16 5.03	65.31	14 27.14	0.514
SUN.	18	13 29 49.81	9.365	9 24 35.5	54.82	16 5.30	65.40	14 39.19	0.489
Mon.	19	13 33 34.89	9.391	9 46 27.1	–54.48	16 5.57	65.49	14 50.63	0.464
Tues.	20	13 37 20.58	9.417	10 8 10.1	54.11	16 5.84	65.58	15 1.46	0.438
Wed.	21	13 41 6.91	9.443	10 29 44.2	53.72	16 6.11	65.67	15 11.66	0.411
Thur.	22	13 44 53.88	9.470	10 51 8.9	–53.32	16 6.38	65.77	15 21.22	0.384
Frid.	23	13 48 41.51	9.498	11 12 23.7	52.90	16 6.65	65.87	15 30.13	0.357
Sat.	24	13 52 29.80	9.526	11 33 28.3	52.46	16 6.92	65.97	15 38.37	0.329
SUN.	25	13 56 18.77	9.555	11 54 22.3	–52.01	16 7.19	66.07	15 45.93	0.300
Mon.	26	14 0 8.43	9.584	12 15 5.2	51.55	16 7.46	66.18	15 52.80	0.271
Tues.	27	14 3 58.80	9.614	12 35 36.8	51.07	16 7.73	66.29	15 58.97	0.241
Wed.	28	14 7 49.90	9.644	12 55 56.6	–50.57	16 7.99	66.39	16 4.42	0.211
Thur.	29	14 11 41.74	9.675	13 16 4.2	50.05	16 8.25	66.50	16 9.13	0.180
Frid.	30	14 15 34.32	9.707	13 35 59.3	49.52	16 8.51	66.61	16 13.09	0.149
Sat.	31	14 19 27.66	9.739	13 55 41.4	48.98	16 8.77	66.72	16 16.29	0.117
SUN.	32	14 23 21.77	9.771	S. 14 15 10.2	–48.41	16 9.02	66.83	16 18.73	0.084

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting $0^s.18$ from the sidereal time.
The sign – prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	12 27 24.19	9.046	S. 2 57 44.7	−58.28	10 5.80	0.810	12 37 29.99
Frid.	2	12 31 1.43	9.058	3 21 2.5	58.20	10 25.11	0.798	12 41 26.54
Sat.	3	12 34 38.97	9.070	3 44 18.1	58.10	10 44.13	0.785	12 45 23.09
SUN.	4	12 38 16.82	9.084	4 7 31.1	−57.98	11 2.83	0.772	12 49 19.65
Mon.	5	12 41 55.00	9.099	4 30 41.2	57.85	11 21.20	0.757	12 53 16.20
Tues.	6	12 45 33.55	9.115	4 53 48.1	57.71	11 39.20	0.742	12 57 12.76
Wed.	7	12 49 12.48	9.131	5 16 51.5	−57.56	11 56.82	0.726	13 1 9.31
Thur.	8	12 52 51.82	9.148	5 39 50.9	57.39	12 14.04	0.708	13 5 5.86
Frid.	9	12 56 31.59	9.166	6 2 46.0	57.20	12 30.82	0.690	13 9 2.42
Sat.	10	13 0 11.81	9.185	6 25 36.5	−57.00	12 47.16	0.671	13 12 58.97
SUN.	11	13 3 52.49	9.206	6 48 22.0	56.78	13 3.03	0.651	13 16 55.52
Mon.	12	13 7 33.67	9.227	7 11 2.1	56.55	13 18.41	0.630	13 20 52.08
Tues.	13	13 11 15.36	9.248	7 33 36.5	−56.30	13 33.27	0.608	13 24 48.63
Wed.	14	13 14 57.58	9.270	7 56 4.8	56.04	13 47.61	0.586	13 28 45.19
Thur.	15	13 18 40.35	9.293	8 18 26.6	55.76	14 1.40	0.563	13 32 41.74
Frid.	16	13 22 23.68	9.317	8 40 41.5	−55.46	14 14.62	0.539	13 36 38.30
Sat.	17	13 26 7.59	9.342	9 2 49.1	55.15	14 27.26	0.514	13 40 34.85
SUN.	18	13 29 52.10	9.367	9 24 48.9	54.82	14 39.31	0.489	13 44 31.41
Mon.	19	13 33 37.21	9.393	9 46 40.6	−54.48	14 50.75	0.464	13 48 27.96
Tues.	20	13 37 22.94	9.419	10 8 23.7	54.12	15 1.57	0.438	13 52 24.52
Wed.	21	13 41 9.30	9.445	10 29 57.8	53.73	15 11.77	0.411	13 56 21.07
Thur.	22	13 44 56.30	9.472	10 51 22.5	−53.33	15 21.32	0.384	14 0 17.62
Frid.	23	13 48 43.96	9.499	11 12 37.3	52.91	15 30.22	0.357	14 4 14.18
Sat.	24	13 52 32.28	9.527	11 33 42.0	52.47	15 38.45	0.329	14 8 10.73
SUN.	25	13 56 21.28	9.556	11 54 36.0	−52.02	15 46.01	0.300	14 12 7.29
Mon.	26	14 0 10.97	9.585	12 15 18.9	51.55	15 52.87	0.271	14 16 3.84
Tues.	27	14 4 1.37	9.615	12 35 50.4	51.07	15 59.03	0.241	14 20 0.40
Wed.	28	14 7 52.49	9.645	12 56 10.1	−50.57	16 4.47	0.211	14 23 56.95
Thur.	29	14 11 44.34	9.676	13 16 17.7	50.05	16 9.18	0.180	14 27 53.51
Frid.	30	14 15 36.94	9.708	13 36 12.7	49.52	16 13.13	0.149	14 31 50.06
Sat.	31	14 19 30.30	9.740	13 55 54.7	48.98	16 16.32	0.117	14 35 46.62
SUN.	32	14 23 24.43	9.772	S. 14 15 23.4	−48.41	16 18.74	0.084	14 39 43.18

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ			THE SUN'S True Longitude. λ′		THE SUN'S Diff. for 1 Hour.	THE SUN'S Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		°	′	″	′	″	″	″			h	m	s
1	274	187	28	0.2	27	15.7	147.51	−0.06	0.000 3800	−52.5	11	20	38.20
2	275	188	27	1.5	26	16.8	147.59	+0.05	0.000 2543	52.4	11	16	42.29
3	276	189	26	4.7	25	19.9	147.67	0.17	0.000 1289	52.2	11	12	46.39
4	277	190	25	9.9	24	25.0	147.76	+0.28	0.000 0039	−52.0	11	8	50.48
5	278	191	24	17.2	23	32.2	147.85	0.38	9.999 8794	51.8	11	4	54.57
6	279	192	23	26.5	22	41.4	147.94	0.43	9.999 7554	51.6	11	0	58.66
7	280	193	22	38.0	21	52.8	148.03	+0.48	9.999 6318	−51.4	10	57	2.76
8	281	194	21	51.8	21	6.4	148.12	0.50	9.999 5087	51.2	10	53	6.85
9	282	195	21	7.7	20	22.3	148.21	0.49	9.999 3861	51.0	10	49	10.94
10	283	196	20	25.9	19	40.4	148.30	+0.46	9.999 2639	−50.8	10	45	15.03
11	284	197	19	46.4	19	0.8	148.40	0.39	9.999 1420	50.7	10	41	19.12
12	285	198	19	9.2	18	23.5	148.50	0.30	9.999 0204	50.6	10	37	23.21
13	286	199	18	34.4	17	48.5	148.59	+0.19	9.998 8990	−50.5	10	33	27.31
14	287	200	18	1.8	17	15.8	148.69	+0.07	9.998 7778	50.5	10	29	31.40
15	288	201	17	31.6	16	45.5	148.79	−0.07	9.998 6566	50.5	10	25	35.49
16	289	202	17	3.7	16	17.4	148.88	−0.21	9.998 5353	−50.6	10	21	39.58
17	290	203	16	38.0	15	51.6	148.97	0.34	9.998 4138	50.6	10	17	43.67
18	291	204	16	14.4	15	27.9	149.06	0.45	9.998 2922	50.7	10	13	47.76
19	292	205	15	52.9	15	6.2	149.15	−0.56	9.998 1703	−50.8	10	9	51.86
20	293	206	15	33.4	14	46.6	149.23	0.62	9.998 0482	50.9	10	5	55.95
21	294	207	15	15.8	14	28.9	149.30	0.66	9.997 9259	51.0	10	2	0.04
22	295	208	15	0.0	14	13.0	149.38	−0.67	9.997 8036	−50.9	9	58	4.13
23	296	209	14	46.0	13	58.8	149.45	0.64	9.997 6814	50.8	9	54	8.22
24	297	210	14	33.6	13	46.4	149.52	0.58	9.997 5596	50.7	9	50	12.31
25	298	211	14	23.0	13	35.6	149.59	−0.50	9.997 4381	−50.5	9	46	16.40
26	299	212	14	14.0	13	26.5	149.66	0.39	9.997 3173	50.3	9	42	20.49
27	300	213	14	6.7	13	19.0	149.73	0.27	9.997 1973	50.0	9	38	24.58
28	301	214	14	1.0	13	13.2	149.80	−0.14	9.997 0783	−49.5	9	34	28.67
29	302	215	13	57.0	13	9.1	149.87	−0.01	9.996 9604	48.9	9	30	32.76
30	303	216	13	54.8	13	6.7	149.94	+0.11	9.996 8436	48.4	9	26	36.85
31	304	217	13	54.2	13	6.0	150.01	0.22	9.996 7282	47.8	9	22	40.94
32	305	218	13	55.4	13	7.0	150.09	+0.32	9.996 6143	−47.2	9	18	45.04

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour, $-9^{s}.8296$. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 3.0	14 59.7	55 8.33	−1.056	54 56.21	−0.964	10 14.0	1.71	11.6
2	14 56.7	14 54.0	54 45.18	0.874	54 35.24	0.783	10 54.3	1.66	12.6
3	14 51.6	14 49.5	54 26.39	0.692	54 18.64	0.599	11 34.0	1.66	13.6
4	14 47.7	14 46.2	54 12.03	−0.502	54 6.62	−0.399	12 14.1	1.70	14.6
5	14 45.1	14 44.3	54 2.48	0.290	53 59.68	−0.175	12 55.6	1.77	15.6
6	14 43.9	14 44.0	53 58.31	−0.051	53 58.49	+0.083	13 39.2	1.87	16.6
7	14 44.5	14 45.5	54 0.34	+0.227	54 3.97	+0.380	14 25.5	1.99	17.6
8	14 47.0	14 49.0	54 9.49	0.542	54 17.02	0.713	15 14.7	2.10	18.6
9	14 51.7	14 54.9	54 26.64	0.892	54 38.45	1.077	16 6.3	2.19	19.6
10	14 58.7	15 3.2	54 52.51	+1.266	55 8.83	+1.455	16 59.4	2.23	20.6
11	15 8.2	15 13.9	55 27.41	1.641	55 48.19	1.820	17 52.8	2.22	21.6
12	15 20.1	15 26.9	56 11.05	1.988	56 35.83	2.139	18 45.6	2.17	22.6
13	15 34.1	15 41.6	57 2.29	+2.266	57 30.10	+2.362	19 37.0	2.11	23.6
14	15 49.5	15 57.5	57 58.84	2.421	58 28.03	2.436	20 27.0	2.06	24.6
15	16 5.4	16 13.1	58 57.10	2.400	59 25.40	2.307	21 16.3	2.05	25.6
16	16 20.4	16 27.1	59 52.22	+2.152	60 16.81	+1.937	22 5.9	2.09	26.6
17	16 33.0	16 37.9	60 38.47	1.663	60 56.50	1.334	22 57.1	2.18	27.6
18	16 41.7	16 44.1	61 10.30	0.960	61 19.41	+0.555	23 51.1	2.32	28.6
19	16 45.3	16 45.0	61 23.54	+0.131	61 22.55	−0.295	6	. .	0.2
20	16 43.4	16 40.4	61 16.52	−0.706	61 5.73	1.086	0 48.8	2.49	1.2
21	16 36.3	16 31.1	60 50.62	1.426	60 31.70	1.715	1 50.3	2.63	2.2
22	16 25.1	16 18.5	60 9.68	−1.946	59 45.24	−2.117	2 54.2	2.68	3.2
23	16 11.4	16 4.0	59 19.10	2.232	58 51.89	2.291	3 57.9	2.61	4.2
24	15 56.4	15 49.0	58 24.32	2.299	57 56.88	2.266	4 58.5	2.43	5.2
25	15 41.7	15 34.6	57 30.06	−2.197	57 4.25	−2.099	5 54.2	2.21	6.2
26	15 27.9	15 21.7	56 39.76	1.979	56 16.82	1.843	6 44.8	2.01	7.2
27	15 15.9	15 10.6	55 55.58	1.696	55 36.15	1.543	7 30.9	1.84	8.2
28	15 5.8	15 1.5	55 18.57	−1.387	55 2.85	−1.232	8 13.5	1.72	9.2
29	14 57.7	14 54.5	54 48.98	1.080	54 36.91	0.933	8 54.0	1.66	10.2
30	14 51.6	14 49.3	54 26.57	0.792	54 17.88	0.658	9 33.6	1.64	11.2
31	14 47.3	14 45.8	54 10.76	0.530	54 5.14	0.408	10 13.3	1.67	12.2
32	14 44.7	14 43.9	54 0.95	−0.291	53 58.14	−0.179	10 54.2	1.74	13.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 1.					SATURDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 34 22.63	1.8542	S. 8 52 30.9	13.977	0	0 0 46.59	1.7727	N. 2 31 56.4	14.21
1	22 36 13.78	1.8508	8 38 31.5	14.002	1	0 2 32.95	1.7727	2 46 8.8	14.19
2	22 38 4.73	1.8475	8 24 30.6	14.027	2	0 4 19.31	1.7727	3 0 20.3	14.18
3	22 39 55.48	1.8443	8 10 28.3	14.050	3	0 6 5.67	1.7728	3 14 30.8	14.16
4	22 41 46.04	1.8412	7 56 24.6	14.073	4	0 7 52.04	1.7730	3 28 40.2	14.14
5	22 43 36.42	1.8381	7 42 19.5	14.096	5	0 9 38.43	1.7733	3 42 48.5	14.12
6	22 45 26.61	1.8351	7 28 13.1	14.117	6	0 11 24.83	1.7735	3 56 55.7	14.11
7	22 47 16.63	1.8322	7 14 5.5	14.137	7	0 13 11.25	1.7738	4 11 1.7	14.09
8	22 49 6.47	1.8293	6 59 56.7	14.156	8	0 14 57.69	1.7743	4 25 6.5	14.06
9	22 50 56.14	1.8265	6 45 46.8	14.174	9	0 16 44.17	1.7749	4 39 10.0	14.04
10	22 52 45.65	1.8238	6 31 35.8	14.192	10	0 18 30.68	1.7754	4 53 12.2	14.02
11	22 54 35.00	1.8212	6 17 23.8	14.207	11	0 20 17.22	1.7760	5 7 13.0	14.00
12	22 56 24.19	1.8186	6 3 10.9	14.222	12	0 22 3.80	1.7768	5 21 12.4	13.977
13	22 58 13.23	1.8161	5 48 57.1	14.237	13	0 23 50.43	1.7775	5 35 10.3	13.952
14	23 0 2.12	1.8137	5 34 42.4	14.252	14	0 25 37.10	1.7783	5 49 6.7	13.927
15	23 1 50.87	1.8113	5 20 26.9	14.265	15	0 27 23.82	1.7792	6 3 1.5	13.900
16	23 3 39.48	1.8090	5 6 10.6	14.277	16	0 29 10.60	1.7802	6 16 54.7	13.874
17	23 5 27.95	1.8068	4 51 53.7	14.287	17	0 30 57.44	1.7811	6 30 46.3	13.846
18	23 7 16.29	1.8047	4 37 36.1	14.298	18	0 32 44.33	1.7821	6 44 36.2	13.817
19	23 9 4.51	1.8026	4 23 17.9	14.307	19	0 34 31.29	1.7833	6 58 24.3	13.787
20	23 10 52.60	1.8006	4 8 59.2	14.316	20	0 36 18.33	1.7846	7 12 10.6	13.757
21	23 12 40.58	1.7987	3 54 40.0	14.324	21	0 38 5.44	1.7858	7 25 55.1	13.726
22	23 14 28.44	1.7968	3 40 20.4	14.330	22	0 39 52.62	1.7870	7 39 37.7	13.694
23	23 16 16.19	1.7950	S. 3 26 0.4	14.336	23	0 41 39.88	1.7884	N. 7 53 18.4	13.662
	FRIDAY 2.					SUNDAY 4.			
0	23 18 3.84	1.7933	S. 3 11 40.1	14.341	0	0 43 27.23	1.7899	N. 8 6 57.1	13.627
1	23 19 51.39	1.7917	2 57 19.5	14.345	1	0 45 14.67	1.7914	8 20 33.7	13.593
2	23 21 38.84	1.7901	2 42 58.7	14.348	2	0 47 2.20	1.7929	8 34 8.3	13.558
3	23 23 26.20	1.7886	2 28 37.7	14.351	3	0 48 49.82	1.7945	8 47 40.7	13.522
4	23 25 13.47	1.7871	2 14 16.6	14.352	4	0 50 37.54	1.7962	9 1 11.0	13.486
5	23 27 0.65	1.7858	1 59 55.4	14.354	5	0 52 25.36	1.7979	9 14 39.0	13.448
6	23 28 47.76	1.7845	1 45 34.1	14.354	6	0 54 13.29	1.7998	9 28 4.8	13.411
7	23 30 34.79	1.7832	1 31 12.9	14.353	7	0 56 1.33	1.8016	9 41 28.3	13.372
8	23 32 21.74	1.7820	1 16 51.7	14.352	8	0 57 49.48	1.8035	9 54 49.4	13.332
9	23 34 8.63	1.7809	1 2 30.7	14.348	9	0 59 37.75	1.8054	10 8 8.1	13.291
10	23 35 55.45	1.7799	0 48 9.9	14.345	10	1 1 26.13	1.8074	10 21 24.3	13.249
11	23 37 42.22	1.7790	0 33 49.3	14.342	11	1 3 14.64	1.8096	10 34 38.0	13.207
12	23 39 28.93	1.7781	0 19 28.9	14.337	12	1 5 3.28	1.8117	10 47 49.2	13.165
13	23 41 15.59	1.7773	S. 0 5 8.9	14.331	13	1 6 52.04	1.8138	11 0 57.8	13.121
14	23 43 2.20	1.7765	N. 0 9 10.8	14.324	14	1 8 40.94	1.8162	11 14 3.7	13.076
15	23 44 48.77	1.7758	0 23 30.0	14.317	15	1 10 29.98	1.8184	11 27 6.9	13 030
16	23 46 35.30	1.7752	0 37 48.8	14.308	16	1 12 19.15	1.8208	11 40 7.3	12.984
17	23 48 21.79	1.7746	0 52 7.0	14.299	17	1 14 8.47	1.8232	11 53 5.0	12.937
18	23 50 8.25	1.7741	1 6 24.7	14.290	18	1 15 57.93	1.8256	12 5 59.8	12.890
19	23 51 54.68	1.7737	1 20 41.8	14.279	19	1 17 47.54	1.8282	12 18 51.8	12.842
20	23 53 41.09	1.7733	1 34 58.2	14.267	20	1 19 37.31	1.8308	12 31 40.8	12.792
21	23 55 27.48	1.7731	1 49 13.9	14.256	21	1 21 27.24	1.8334	12 44 26.8	12.742
22	23 57 13.86	1.7729	2 3 28.9	14.243	22	1 23 17.32	1.8360	12 57 9.8	12.691
23	23 59 0.23	1.7728	2 17 43.1	14.229	23	1 25 7.56	1.8388	13 9 49.7	12.639
24	0 0 46.59	1.7727	N. 2 31 56.4	14.214	24	1 26 57.97	1.8416	N. 13 22 26.5	12.587

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 5.					**WEDNESDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 26 57.97	1.8416	N. 13 22 26.5	12.587	0	2 59 24.45	2.0238	N. 22 10 19.8	9.084
1	1 28 48.55	1.8444	13 35 0.1	12.533	1	3 1 26.01	2.0283	22 19 22.0	8.990
2	1 30 39.30	1.8473	13 47 30.5	12.479	2	3 3 27.84	2.0328	22 28 18.6	8.896
3	1 32 30.22	1.8502	13 59 57.6	12.424	3	3 5 29.94	2.0373	22 37 9.5	8.800
4	1 34 21.32	1.8532	14 12 21.4	12.368	4	3 7 32.31	2.0418	22 45 54.6	8.703
5	1 36 12.60	1.8562	14 24 41.8	12.312	5	3 9 34.95	2.0463	22 54 33.9	8.607
6	1 38 4.06	1.8593	14 36 58.8	12.254	6	3 11 37.86	2.0508	23 3 7.4	8.508
7	1 39 55.71	1.8624	14 49 12.3	12.196	7	3 13 41.05	2.0554	23 11 34.9	8.409
8	1 41 47.55	1.8657	15 1 22.3	12.137	8	3 15 44.51	2.0598	23 19 56.5	8.310
9	1 43 39.59	1.8689	15 13 28.8	12.077	9	3 17 48.23	2.0643	23 28 12.1	8.209
10	1 45 31.82	1.8722	15 25 31.6	12.017	10	3 19 52.23	2.0689	23 36 21.6	8.107
11	1 47 24.25	1.8754	15 37 30.8	11.955	11	3 21 56.50	2.0735	23 44 25.0	8.005
12	1 49 16.87	1.8788	15 49 26.2	11.892	12	3 24 1.05	2.0781	23 52 22.2	7.902
13	1 51 9.70	1.8822	16 1 17.8	11.829	13	3 26 5.87	2.0826	24 0 13.2	7.797
14	1 53 2.73	1.8856	16 13 5.7	11.766	14	3 28 10.96	2.0871	24 7 57.9	7.692
15	1 54 55.97	1.8892	16 24 49.7	11.700	15	3 30 16.32	2.0916	24 15 36.3	7.587
16	1 56 49.43	1.8928	16 36 29.7	11.634	16	3 32 21.95	2.0961	24 23 8.3	7.480
17	1 58 43.10	1.8963	16 48 5.8	11.568	17	3 34 27.85	2.1006	24 30 33.9	7.373
18	2 0 36.98	1.8998	16 59 37.9	11.501	18	3 36 34.02	2.1051	24 37 53.1	7.265
19	2 2 31.08	1.9035	17 11 5.9	11.432	19	3 38 40.46	2.1096	24 45 5.7	7.155
20	2 4 25.40	1.9073	17 22 29.7	11.362	20	3 40 47.17	2.1141	24 52 11.7	7.045
21	2 6 19.95	1.9110	17 33 49.4	11.293	21	3 42 54.15	2.1185	24 59 11.1	6.935
22	2 8 14.72	1.9148	17 45 4.9	11.222	22	3 45 1.39	2.1229	25 6 3.9	6.823
23	2 10 9.72	1.9186	N. 17 56 16.1	11.151	23	3 47 8.90	2.1274	N. 25 12 49.9	6.711
	TUESDAY 6.					**THURSDAY 8.**			
0	2 12 4.95	1.9224	N. 18 7 23.0	11.078	0	3 49 16.68	2.1318	N. 25 19 29.2	6.597
1	2 14 0.41	1.9263	18 18 25.5	11.005	1	3 51 24.72	2.1362	25 26 1.6	6.483
2	2 15 56.11	1.9303	18 29 23.6	10.931	2	3 53 33.02	2.1405	25 32 27.2	6.369
3	2 17 52.04	1.9342	18 40 17.2	10.856	3	3 55 41.58	2.1449	25 38 45.9	6.253
4	2 19 48.21	1.9383	18 51 6.3	10.781	4	3 57 50.41	2.1493	25 44 57.6	6.137
5	2 21 44.63	1.9423	19 1 50.9	10.704	5	3 59 59.49	2.1535	25 51 2.3	6.020
6	2 23 41.29	1.9463	19 12 30.8	10.626	6	4 2 8.83	2.1577	25 57 0.0	5.902
7	2 25 38.18	1.9503	19 23 6.0	10.547	7	4 4 18.41	2.1619	26 2 50.5	5.782
8	2 27 35.33	1.9545	19 33 36.5	10.469	8	4 6 28.26	2.1662	26 8 33.9	5.663
9	2 29 32.72	1.9587	19 44 2.3	10.389	9	4 8 38.36	2.1703	26 14 10.1	5.543
10	2 31 30.37	1.9628	19 54 23.2	10.307	10	4 10 48.70	2.1744	26 19 39.1	5.422
11	2 33 28.26	1.9670	20 4 39.2	10.226	11	4 12 59.29	2.1786	26 25 0.8	5.301
12	2 35 26.41	1.9713	20 14 50.3	10.143	12	4 15 10.13	2.1827	26 30 15.2	5.178
13	2 37 24.81	1.9755	20 24 56.4	10.059	13	4 17 21.21	2.1867	26 35 22.2	5.054
14	2 39 23.47	1.9798	20 34 57.4	9.975	14	4 19 32.53	2.1908	26 40 21.7	4.930
15	2 41 22.39	1.9841	20 44 53.4	9.890	15	4 21 44.10	2.1948	26 45 13.8	4.806
16	2 43 21.56	1.9884	20 54 44.2	9.804	16	4 23 55.90	2.1985	26 49 58.4	4.681
17	2 45 21.00	1.9928	21 4 29.9	9.717	17	4 26 7.92	2.2023	26 54 35.5	4.555
18	2 47 20.70	1.9972	21 14 10.3	9.629	18	4 28 20.18	2.2062	26 59 5.0	4.427
19	2 49 20.66	2.0016	21 23 45.4	9.541	19	4 30 32.67	2.2100	27 3 26.8	4.300
20	2 51 20.89	2.0059	21 33 15.2	9.452	20	4 32 45.38	2.2137	27 7 41.0	4.172
21	2 53 21.37	2.0103	21 42 39.6	9.361	21	4 34 58.31	2.2174	27 11 47.4	4.042
22	2 55 22.13	2.0149	21 51 58.5	9.269	22	4 37 11.47	2.2211	27 15 46.1	3.913
23	2 57 23.16	2.0193	22 1 11.9	9.177	23	4 39 24.84	2.2246	27 19 37.0	3.783
24	2 59 24.45	2.0238	N. 22 10 19.8	9.084	24	4 41 38.42	2.2281	N. 27 23 20.1	3.652

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 9.			
	h m s	s	° ′ ″	″
0	4 41 38.42	2.2281	N. 27 23 20.1	3.652
1	4 43 52.21	2.2316	27 26 55.3	3.521
2	4 46 6.21	2.2350	27 30 22.6	3.388
3	4 48 20.41	2.2383	27 33 41.9	3.256
4	4 50 34.81	2.2417	27 36 53.3	3.122
5	4 52 49.41	2.2448	27 39 56.6	2.988
6	4 55 4.19	2.2480	27 42 51.9	2.854
7	4 57 19.17	2.2512	27 45 39.1	2.719
8	4 59 34.33	2.2543	27 48 18.2	2.583
9	5 1 49.68	2.2573	27 50 49.1	2.447
10	5 4 5.20	2.2601	27 53 11.9	2.311
11	5 6 20.89	2.2629	27 55 26.4	2.172
12	5 8 36.75	2.2657	27 57 32.6	2.035
13	5 10 52.77	2.2684	27 59 30.6	1.897
14	5 13 8.96	2.2712	28 1 20.2	1.757
15	5 15 25.31	2.2738	28 3 1.5	1.619
16	5 17 41.81	2.2762	28 4 34.5	1.479
17	5 19 58.45	2.2786	28 5 59.0	1.338
18	5 22 15.24	2.2810	28 7 15.1	1.197
19	5 24 32.17	2.2833	28 8 22.7	1.057
20	5 26 49.23	2.2854	28 9 21.9	0.915
21	5 29 6.42	2.2876	28 10 12.5	0.772
22	5 31 23.74	2.2897	28 10 54.6	0.631
23	5 33 41.18	2.2917	N. 28 11 28.2	0.488
	SATURDAY 10.			
0	5 35 58.74	2.2936	N. 28 11 53.2	0.345
1	5 38 16.41	2.2953	28 12 9.6	0.202
2	5 40 34.18	2.2972	28 12 17.4	+0.057
3	5 42 52.07	2.2989	28 12 16.5	−0.087
4	5 45 10.05	2.3004	28 12 7.0	0.231
5	5 47 28.12	2.3019	28 11 48.8	0.376
6	5 49 46.28	2.3033	28 11 21.9	0.520
7	5 52 4.52	2.3048	28 10 46.4	0.665
8	5 54 22.85	2.3061	28 10 2.1	0.811
9	5 56 41.25	2.3073	28 9 9.1	0.957
10	5 58 59.72	2.3084	28 8 7.3	1.103
11	6 1 18.26	2.3094	28 6 56.7	1.249
12	6 3 36.85	2.3103	28 5 37.4	1.395
13	6 5 55.50	2.3113	28 4 9.3	1.542
14	6 8 14.20	2.3120	28 2 32.4	1.688
15	6 10 32.94	2.3128	28 0 46.7	1.835
16	6 12 51.73	2.3134	27 58 52.2	1.982
17	6 15 10.55	2.3139	27 56 48.9	2.128
18	6 17 29.40	2.3145	27 54 36.8	2.275
19	6 19 48.29	2.3149	27 52 15.9	2.422
20	6 22 7.19	2.3152	27 49 46.1	2.570
21	6 24 26.11	2.3155	27 47 7.5	2.717
22	6 26 45.05	2.3157	27 44 20.0	2.865
23	6 29 3.99	2.3158	27 41 23.7	3.012
24	6 31 22.94	2.3158	N. 27 38 18.6	3.159

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 11.			
	h m s	s	° ′ ″	″
0	6 31 22.94	2.3158	N. 27 38 18.6	3.15
1	6 33 41.89	2.3158	27 35 4.6	3.30
2	6 36 0.83	2.3156	27 31 41.8	3.45
3	6 38 19.76	2.3153	27 28 10.1	3.60
4	6 40 38.67	2.3150	27 24 29.7	3.74
5	6 42 57.56	2.3148	27 20 40.4	3.89
6	6 45 16.44	2.3144	27 16 42.2	4.04
7	6 47 35.29	2.3138	27 12 35.2	4.18
8	6 49 54.10	2.3133	27 8 19.5	4.33
9	6 52 12.88	2.3127	27 3 54.9	4.48
10	6 54 31.62	2.3120	26 59 21.6	4.62
11	6 56 50.32	2.3113	26 54 39.4	4.77
12	6 59 8.97	2.3103	26 49 48.5	4.92
13	7 1 27.56	2.3094	26 44 48.8	5.06
14	7 3 46.10	2.3085	26 39 40.3	5.21
15	7 6 4.58	2.3075	26 34 23.1	5.35
16	7 8 23.00	2.3063	26 28 57.2	5.50
17	7 10 41.34	2.3052	26 23 22.6	5.64
18	7 12 59.62	2.3041	26 17 39.3	5.79
19	7 15 17.83	2.3028	26 11 47.3	5.93
20	7 17 35.96	2.3014	26 5 46.7	6.08
21	7 19 54.00	2.3000	25 59 37.5	6.22
22	7 22 11.96	2.2986	25 53 19.6	6.37
23	7 24 29.83	2.2972	N. 25 46 53.1	6.51
	MONDAY 12.			
0	7 26 47.62	2.2957	N. 25 40 18.1	6.65
1	7 29 5.31	2.2940	25 33 34.5	6.79
2	7 31 22.90	2.2923	25 26 42.4	6.93
3	7 33 40.39	2.2907	25 19 41.8	7.08
4	7 35 57.78	2.2890	25 12 32.7	7.22
5	7 38 15.07	2.2873	25 5 15.2	7.36
6	7 40 32.25	2.2854	24 57 49.2	7.50
7	7 42 49.32	2.2836	24 50 14.9	7.64
8	7 45 6.28	2.2818	24 42 32.2	7.78
9	7 47 23.13	2.2798	24 34 41.1	7.92
10	7 49 39.86	2.2778	24 26 41.7	8.05
11	7 51 56.47	2.2758	24 18 34.0	8.19
12	7 54 12.96	2.2738	24 10 18.1	8.33
13	7 56 29.33	2.2718	24 1 53.9	8.47
14	7 58 45.57	2.2697	23 53 21.6	8.60
15	8 1 1.69	2.2676	23 44 41.1	8.74
16	8 3 17.68	2.2654	23 35 52.5	8.87
17	8 5 33.54	2.2633	23 26 55.8	9.01
18	8 7 49.27	2.2611	23 17 51.0	9.14
19	8 10 4.87	2.2589	23 8 38.3	9.27
20	8 12 20.34	2.2567	22 59 17.5	9.41
21	8 14 35.67	2.2544	22 49 48.8	9.54
22	8 16 50.87	2.2522	22 40 12.2	9.67
23	8 19 5.93	2.2499	22 30 27.7	9.80
24	8 21 20.86	2.2477	N. 22 20 35.4	9.93

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 13.					**THURSDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 21 20.86	2.2477	N. 22 20 35.4	9.937	0	10 6 46.42	2.1556	N. 12 9 17.7	15.169
1	8 23 35.65	2.2453	22 10 35.3	10.066	1	10 8 55.73	2.1546	11 54 5.0	15.252
2	8 25 50.30	2.2430	22 0 27.5	10.194	2	10 11 4.97	2.1536	11 38 47.4	15.334
3	8 28 4.81	2.2408	21 50 12.0	10.322	3	10 13 14.16	2.1528	11 23 24.9	15.416
4	8 30 19.19	2.2385	21 39 48.8	10.450	4	10 15 23.30	2.1520	11 7 57.5	15.496
5	8 32 33.43	2.2362	21 29 18.0	10.576	5	10 17 32.40	2.1513	10 52 25.4	15.574
6	8 34 47.53	2.2338	21 18 39.7	10.702	6	10 19 41.46	2.1507	10 36 48.6	15.652
7	8 37 1.49	2.2315	21 7 53.8	10.827	7	10 21 50.48	2.1500	10 21 7.2	15.727
8	8 39 15.31	2.2292	20 57 0.4	10.951	8	10 23 59.46	2.1494	10 5 21.3	15.802
9	8 41 28.99	2.2269	20 45 59.7	11.074	9	10 26 8.41	2.1489	9 49 30.9	15.876
10	8 43 42.54	2.2247	20 34 51.5	11.197	10	10 28 17.33	2.1485	9 33 36.2	15.947
11	8 45 55.95	2.2223	20 23 36.0	11.319	11	10 30 26.23	2.1482	9 17 37.2	16.018
12	8 48 9.22	2.2200	20 12 13.2	11.440	12	10 32 35.11	2.1479	9 1 34.0	16.087
13	8 50 22.35	2.2177	20 0 43.2	11.560	13	10 34 43.98	2.1478	8 45 26.7	16.155
14	8 52 35.34	2.2154	19 49 6.0	11.680	14	10 36 52.84	2.1476	8 29 15.4	16.222
15	8 54 48.20	2.2133	19 37 21.6	11.799	15	10 39 1.69	2.1475	8 13 0.1	16.287
16	8 57 0.93	2.2110	19 25 30.1	11.917	16	10 41 10.54	2.1474	7 56 41.0	16.350
17	8 59 13.52	2.2087	19 13 31.6	12.033	17	10 43 19.38	2.1475	7 40 18.1	16.412
18	9 1 25.97	2.2065	19 1 26.1	12.149	18	10 45 28.24	2.1478	7 23 51.5	16.473
19	9 3 38.30	2.2043	18 49 13.7	12.264	19	10 47 37.11	2.1479	7 7 21.3	16.533
20	9 5 50.49	2.2022	18 36 54.4	12.378	20	10 49 45.99	2.1482	6 50 47.5	16.591
21	9 8 2.56	2.2001	18 24 28.3	12.492	21	10 51 54.89	2.1486	6 34 10.4	16.647
22	9 10 14.50	2.1979	18 11 55.4	12.604	22	10 54 3.82	2.1490	6 17 29.9	16.702
23	9 12 26.31	2.1958	N. 17 59 15.8	12.716	23	10 56 12.77	2.1495	N. 6 0 46.1	16.756
	WEDNESDAY 14.					**FRIDAY 16.**			
0	9 14 38.00	2.1938	N. 17 46 29.5	12.827	0	10 58 21.76	2.1502	N. 5 43 59.2	16.808
1	9 16 49.56	2.1917	17 33 36.6	12.936	1	11 0 30.79	2.1508	5 27 9.2	16.858
2	9 19 1.00	2.1897	17 20 37.2	13.044	2	11 2 39.85	2.1514	5 10 16.2	16.907
3	9 21 12.32	2.1877	17 7 31.3	13.152	3	11 4 48.96	2.1523	4 53 20.4	16.954
4	9 23 23.52	2.1858	16 54 19.0	13.258	4	11 6 58.12	2.1533	4 36 21.7	17.000
5	9 25 34.61	2.1838	16 41 0.3	13.364	5	11 9 7.35	2.1543	4 19 20.4	17.044
6	9 27 45.58	2.1819	16 27 35.3	13.469	6	11 11 16.63	2.1553	4 2 16.4	17.087
7	9 29 56.44	2.1801	16 14 4.0	13.573	7	11 13 25.98	2.1564	3 45 10.0	17.127
8	9 32 7.19	2.1783	16 0 26.5	13.676	8	11 15 35.40	2.1577	3 28 1.1	17.167
9	9 34 17.83	2.1765	15 46 42.9	13.777	9	11 17 44.90	2.1590	3 10 50.0	17.204
10	9 36 28.37	2.1748	15 32 53.3	13.877	10	11 19 54.48	2.1603	2 53 36.6	17.241
11	9 38 38.81	2.1732	15 18 57.6	13.977	11	11 22 4.14	2.1618	2 36 21.1	17.275
12	9 40 49.15	2.1715	15 4 56.0	14.075	12	11 24 13.89	2.1633	2 19 3.6	17.307
13	9 42 59.39	2.1698	14 50 48.6	14.172	13	11 26 23.74	2.1649	2 1 44.2	17.338
14	9 45 9.53	2.1683	14 36 35.3	14.269	14	11 28 33.68	2.1667	1 44 23.0	17.367
15	9 47 19.58	2.1668	14 22 16.3	14.364	15	11 30 43.74	2.1685	1 27 0.1	17.395
16	9 49 29.55	2.1654	14 7 51.6	14.458	16	11 32 53.90	2.1703	1 9 35.6	17.421
17	9 51 39.43	2.1640	13 53 21.3	14.552	17	11 35 4.18	2.1723	0 52 9.6	17.445
18	9 53 49.23	2.1626	13 38 45.4	14.643	18	11 37 14.58	2.1743	0 34 42.2	17.467
19	9 55 58.94	2.1613	13 24 4.1	14.734	19	11 39 25.10	2.1765	N. 0 17 13.6	17.487
20	9 58 8.58	2.1600	13 9 17.3	14.824	20	11 41 35.76	2.1787	S. 0 0 16.3	17.507
21	10 0 18.14	2.1588	12 54 25.2	14.912	21	11 43 46.54	2.1809	0 17 47.2	17.523
22	10 2 27.63	2.1577	12 39 27.9	14.999	22	11 45 57.47	2.1833	0 35 19.0	17.537
23	10 4 37.06	2.1566	12 24 25.3	15.085	23	11 48 8.54	2.1858	0 52 51.7	17.551
24	10 6 46.42	2.1556	N. 12 9 17.7	15.169	24	11 50 19.77	2.1884	S. 1 10 25.1	17.562

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min
	SATURDAY 17.					**MONDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 50 19.77	2.1884	S. 1 10 25.1	17.562	0	13 39 49.94	2.4018	S. 14 47 54.0	15.6
1	11 52 31.15	2.1910	1 27 59.1	17.572	1	13 42 14.23	2.4078	15 3 31.5	15.5
2	11 54 42.69	2.1937	1 45 33.7	17.579	2	13 44 38.88	2.4138	15 19 3.3	15.4
3	11 56 54.39	2.1964	2 3 8.6	17.584	3	13 47 3.89	2.4198	15 34 29.3	15.3
4	11 59 6.26	2.1993	2 20 43.8	17.588	4	13 49 29.26	2.4259	15 49 49.3	15.2
5	12 1 18.31	2.2023	2 38 19.2	17.590	5	13 51 55.00	2.4320	16 5 3.2	15.1
6	12 3 30.54	2.2054	2 55 54.6	17.589	6	13 54 21.10	2.4381	16 20 10.8	15.0
7	12 5 42.96	2.2085	3 13 29.9	17.587	7	13 56 47.57	2.4443	16 35 12.1	14.9
8	12 7 55.56	2.2117	3 31 5.0	17.583	8	13 59 14.41	2.4504	16 50 6.8	14.8
9	12 10 8.36	2.2150	3 48 39.9	17.577	9	14 1 41.62	2.4566	17 4 54.9	14.74
10	12 12 21.36	2.2184	4 6 14.3	17.569	10	14 4 9.20	2.4628	17 19 36.2	14.63
11	12 14 34.57	2.2219	4 23 48.2	17.559	11	14 6 37.15	2.4690	17 34 10.6	14.51
12	12 16 47.99	2.2255	4 41 21.4	17.547	12	14 9 5.48	2.4753	17 48 38.0	14.39
13	12 19 1.63	2.2291	4 58 53.8	17.532	13	14 11 34.18	2.4814	18 2 58.2	14.27
14	12 21 15.48	2.2328	5 16 25.3	17.517	14	14 14 3.25	2.4876	18 17 11.0	14.15
15	12 23 29.56	2.2366	5 33 55.8	17.498	15	14 16 32.69	2.4938	18 31 16.4	14.02
16	12 25 43.87	2.2404	5 51 25.1	17.477	16	14 19 2.50	2.5000	18 45 14.2	13.89
17	12 27 58.41	2.2444	6 8 53.1	17.455	17	14 21 32.69	2.5063	18 59 4.3	13.77
18	12 30 13.20	2.2485	6 26 19.7	17.430	18	14 24 3.25	2.5124	19 12 46.6	13.63
19	12 32 28.23	2.2526	6 43 44.7	17.403	19	14 26 34.18	2.5186	19 26 20.9	13.50
20	12 34 43.51	2.2568	7 1 8.1	17.375	20	14 29 5.48	2.5248	19 39 47.0	13.36
21	12 36 59.04	2.2610	7 18 29.7	17.344	21	14 31 37.15	2.5309	19 53 5.0	13.23
22	12 39 14.83	2.2654	7 35 49.4	17.311	22	14 34 9.19	2.5370	20 6 14.6	13.08
23	12 41 30.89	2.2698	S. 7 53 7.0	17.276	23	14 36 41.59	2.5431	S. 20 19 15.7	12.94
	SUNDAY 18.					**TUESDAY 20.**			
0	12 43 47.21	2.2743	S. 8 10 22.5	17.239	0	14 39 14.36	2.5492	S. 20 32 8.2	12.80
1	12 46 3.81	2.2789	8 27 35.7	17.199	1	14 41 47.49	2.5552	20 44 52.0	12.65
2	12 48 20.68	2.2835	8 44 46.4	17.157	2	14 44 20.98	2.5612	20 57 26.9	12.50
3	12 50 37.83	2.2883	9 1 54.5	17.112	3	14 46 54.83	2.5672	21 9 52.8	12.35
4	12 52 55.27	2.2930	9 18 59.9	17.067	4	14 49 29.04	2.5730	21 22 9.7	12.20
5	12 55 12.99	2.2978	9 36 2.5	17.019	5	14 52 3.59	2.5788	21 34 17.4	12.05
6	12 57 31.01	2.3028	9 53 2.2	16.968	6	14 54 38.50	2.5847	21 46 15.7	11.89
7	12 59 49.33	2.3078	10 9 58.7	16.915	7	14 57 13.75	2.5903	21 58 4.6	11.736
8	13 2 7.95	2.3129	10 26 52.0	16.860	8	14 59 49.34	2.5960	22 9 44.0	11.576
9	13 4 26.88	2.3181	10 43 41.9	16.802	9	15 2 25.27	2.6016	22 21 13.7	11.413
10	13 6 46.12	2.3233	11 0 28.3	16.743	10	15 5 1.53	2.6071	22 32 33.6	11.249
11	13 9 5.67	2.3285	11 17 11.1	16.682	11	15 7 38.12	2.6126	22 43 43.6	11.084
12	13 11 25.54	2.3338	11 33 50.1	16.617	12	15 10 15.04	2.6180	22 54 43.7	10.917
13	13 13 45.73	2.3392	11 50 25.2	16.551	13	15 12 52.28	2.6233	23 5 33.7	10.747
14	13 16 6.24	2.3446	12 6 56.2	16.482	14	15 15 29.84	2.6285	23 16 13.4	10.576
15	13 18 27.08	2.3501	12 23 23.1	16.412	15	15 18 7.70	2.6336	23 26 42.8	10.403
16	13 20 48.25	2.3557	12 39 45.7	16.339	16	15 20 45.87	2.6387	23 37 1.8	10.230
17	13 23 9.76	2.3613	12 56 3.8	16.262	17	15 23 24.34	2.6436	23 47 10.4	10.054
18	13 25 31.61	2.3669	13 12 17.2	16.185	18	15 26 3.10	2.6484	23 57 8.3	9.877
19	13 27 53.79	2.3726	13 28 26.0	16.106	19	15 28 42.15	2.6532	24 6 55.6	9.698
20	13 30 16.32	2.3784	13 44 29.9	16.023	20	15 31 21.48	2.6578	24 16 32.1	9.517
21	13 32 39.20	2.3843	14 0 28.8	15.938	21	15 34 1.09	2.6623	24 25 57.7	9.336
22	13 35 2.43	2.3901	14 16 22.5	15.851	22	15 36 40.96	2.6667	24 35 12.4	9.153
23	13 37 26.01	2.3959	14 32 10.9	15.762	23	15 39 21.09	2.6709	24 44 16.1	8.969
24	13 39 49.94	2.4018	S. 14 47 54.0	15.672	24	15 42 1.47	2.6750	S. 24 53 8.7	8.783

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 21.					**FRIDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 42 1.47	2.6750	S. 24 53 8.7	8.783	0	17 52 11.44	2.6802	S. 28 6 9.5	0.802
1	15 44 42.09	2.6791	25 1 50.1	8.596	1	17 54 52.12	2.6758	28 5 15.5	0.997
2	15 47 22.96	2.6830	25 10 20.2	8.407	2	17 57 32.53	2.6713	28 4 9.8	1.190
3	15 50 4.05	2.6868	25 18 38.9	8.217	3	18 0 12.67	2.6667	28 2 52.7	1.382
4	15 52 45.37	2.6904	25 26 46.2	8.027	4	18 2 52.53	2.6619	28 1 24.0	1.572
5	15 55 26.90	2.6938	25 34 42.1	7.835	5	18 5 32.10	2.6570	27 59 44.0	1.762
6	15 58 8.63	2.6972	25 42 26.4	7.642	6	18 8 11.37	2.6519	27 57 52.5	1.952
7	16 0 50.56	2.7003	25 49 59.1	7.447	7	18 10 50.33	2.6467	27 55 49.8	2.139
8	16 3 32.67	2.7033	25 57 20.1	7.252	8	18 13 28.97	2.6413	27 53 35.8	2.326
9	16 6 14.96	2.7063	26 4 29.4	7.057	9	18 16 7.29	2.6358	27 51 10.7	2.511
10	16 8 57.42	2.7089	26 11 26.9	6.860	10	18 18 45.27	2.6302	27 48 34.5	2.695
11	16 11 40.03	2.7115	26 18 12.6	6.662	11	18 21 22.91	2.6244	27 45 47.3	2.878
12	16 14 22.80	2.7139	26 24 46.4	6.464	12	18 24 0.20	2.6184	27 42 49.1	3.060
13	16 17 5.70	2.7162	26 31 8.3	6.265	13	18 26 37.12	2.6123	27 39 40.1	3.239
14	16 19 48.74	2.7183	26 37 18.2	6.064	14	18 29 13.68	2.6062	27 36 20.4	3.417
15	16 22 31.89	2.7202	26 43 16.0	5.863	15	18 31 49.86	2.5998	27 32 50.0	3.596
16	16 25 15.16	2.7219	26 49 1.8	5.662	16	18 34 25.66	2.5934	27 29 8.9	3.772
17	16 27 58.52	2.7233	26 54 35.5	5.461	17	18 37 1.07	2.5868	27 25 17.4	3.946
18	16 30 41.96	2.7248	26 59 57.1	5.258	18	18 39 36.08	2.5802	27 21 15.4	4.119
19	16 33 25.49	2.7260	27 5 6.5	5.055	19	18 42 10.69	2.5735	27 17 3.1	4.291
20	16 36 9.08	2.7270	27 10 3.7	4.852	20	18 44 44.90	2.5667	27 12 40.5	4.461
21	16 38 52.73	2.7278	27 14 48.8	4.649	21	18 47 18.69	2.5596	27 8 7.8	4.629
22	16 41 36.42	2.7285	27 19 21.6	4.445	22	18 49 52.05	2.5526	27 3 25.0	4.797
23	16 44 20.15	2.7290	S. 27 23 42.2	4.241	23	18 52 25.00	2.5455	S. 26 58 32.2	4.962
	THURSDAY 22.					**SATURDAY 24.**			
0	16 47 3.90	2.7293	S. 27 27 50.5	4.036	0	18 54 57.51	2.5382	S. 26 53 29.5	5.126
1	16 49 47.66	2.7293	27 31 46.5	3.832	1	18 57 29.58	2.5308	26 48 17.1	5.288
2	16 52 31.42	2.7293	27 35 30.3	3.627	2	19 0 1.21	2.5234	26 42 54.9	5.450
3	16 55 15.17	2.7290	27 39 1.8	3.422	3	19 2 32.39	2.5160	26 37 23.1	5.609
4	16 57 58.90	2.7286	27 42 21.0	3.217	4	19 5 3.13	2.5084	26 31 41.8	5.767
5	17 0 42.60	2.7279	27 45 27.9	3.013	5	19 7 33.40	2.5008	26 25 51.1	5.922
6	17 3 26.25	2.7270	27 48 22.6	2.809	6	19 10 3.22	2.4932	26 19 51.1	6.077
7	17 6 9.84	2.7259	27 51 5.0	2.605	7	19 12 32.58	2.4853	26 13 41.9	6.230
8	17 8 53.36	2.7248	27 53 35.2	2.401	8	19 15 1.46	2.4775	26 7 23.5	6.381
9	17 11 36.81	2.7234	27 55 53.1	2.197	9	19 17 29.88	2.4697	26 0 56.2	6.530
10	17 14 20.17	2.7218	27 57 58.8	1.992	10	19 19 57.82	2.4618	25 54 19.9	6.678
11	17 17 3.42	2.7200	27 59 52.2	1.789	11	19 22 25.29	2.4538	25 47 34.8	6.825
12	17 19 46.57	2.7181	28 1 33.5	1.587	12	19 24 52.28	2.4458	25 40 40.9	6.969
13	17 22 29.59	2.7158	28 3 2.6	1.383	13	19 27 18.78	2.4377	25 33 38.5	7.112
14	17 25 12.47	2.7134	28 4 19.5	1.182	14	19 29 44.80	2.4296	25 26 27.5	7.253
15	17 27 55.20	2.7109	28 5 24.4	0.981	15	19 32 10.33	2.4215	25 19 8.1	7.392
16	17 30 37.78	2.7082	28 6 17.2	0.779	16	19 34 35.38	2.4133	25 11 40.4	7.531
17	17 33 20.18	2.7053	28 6 57.9	0.578	17	19 36 59.93	2.4051	25 4 4.4	7.667
18	17 36 2.41	2.7023	28 7 26.6	0.379	18	19 39 23.99	2.3969	24 56 20.4	7.801
19	17 38 44.45	2.6990	28 7 43.4	−0.181	19	19 41 47.56	2.3888	24 48 28.3	7.933
20	17 41 26.29	2.6956	28 7 48.3	+0.017	20	19 44 10.64	2.3806	24 40 28.4	8.064
21	17 44 7.92	2.6920	28 7 41.3	0.216	21	19 46 33.23	2.3722	24 32 20.6	8.194
22	17 46 49.33	2.6882	28 7 22.4	0.412	22	19 48 55.31	2.3639	24 24 5.1	8.322
23	17 49 30.50	2.6843	28 6 51.8	0.607	23	19 51 16.90	2.3558	24 15 42.0	8.447
24	17 52 11.44	2.6802	S. 28 6 9.5	0.802	24	19 53 38.00	2.3475	S. 24 7 11.4	8.572

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 25.					TUESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 53 38.00	2.3475	S. 24 7 11.4	8.572	0	21 37 18.47	1.9915	S. 15 22 28.5	12.733
1	19 55 58.60	2.3392	23 58 33.4	8.694	1	21 39 17.78	1.9856	15 9 42.9	12.787
2	19 58 18.70	2.3309	23 49 48.1	8.816	2	21 41 16.74	1.9798	14 56 54.1	12.838
3	20 0 38.31	2.3227	23 40 55.5	8.935	3	21 43 15.36	1.9740	14 44 2.3	12.889
4	20 2 57.42	2.3144	23 31 55.9	9.052	4	21 45 13.62	1.9683	14 31 7.4	12.940
5	20 5 16.04	2.3062	23 22 49.2	9.169	5	21 47 11.55	1.9627	14 18 9.5	12.989
6	20 7 34.16	2.2979	23 13 35.6	9.283	6	21 49 9.14	1.9572	14 5 8.7	13.037
7	20 9 51.79	2.2898	23 4 15.2	9.396	7	21 51 6.41	1.9518	13 52 5.1	13.082
8	20 12 8.93	2.2816	22 54 48.1	9.507	8	21 53 3.35	1.9463	13 38 58.8	13.128
9	20 14 25.58	2.2734	22 45 14.4	9.616	9	21 54 59.96	1.9409	13 25 49.7	13.173
10	20 16 41.74	2.2653	22 35 34.2	9.724	10	21 56 56.26	1.9358	13 12 38.0	13.216
11	20 18 57.41	2.2572	22 25 47.5	9.831	11	21 58 52.25	1.9306	12 59 23.8	13.258
12	20 21 12.60	2.2491	22 15 54.5	9.935	12	22 0 47.93	1.9255	12 46 7.0	13.300
13	20 23 27.30	2.2409	22 5 55.3	10.038	13	22 2 43.31	1.9205	12 32 47.8	13.340
14	20 25 41.51	2.2329	21 55 49.9	10.140	14	22 4 38.39	1.9157	12 19 26.2	13.379
15	20 27 55.25	2.2250	21 45 38.5	10.240	15	22 6 33.19	1.9108	12 6 2.3	13.417
16	20 30 8.51	2.2170	21 35 21.1	10.339	16	22 8 27.69	1.9060	11 52 36.1	13.454
17	20 32 21.29	2.2091	21 24 57.8	10.436	17	22 10 21.91	1.9013	11 39 7.8	13.490
18	20 34 33.60	2.2013	21 14 28.8	10.531	18	22 12 15.85	1.8968	11 25 37.3	13.526
19	20 36 45.44	2.1934	21 3 54.1	10.625	19	22 14 9.53	1.8923	11 12 4.7	13.560
20	20 38 56.81	2.1856	20 53 13.8	10.717	20	22 16 2.93	1.8878	10 58 30.1	13.592
21	20 41 7.71	2.1778	20 42 28.1	10.807	21	22 17 56.07	1.8835	10 44 53.6	13.624
22	20 43 18.15	2.1702	20 31 36.9	10.897	22	22 19 48.95	1.8793	10 31 15.2	13.656
23	20 45 28.13	2.1625	S. 20 20 40.4	10.985	23	22 21 41.58	1.8751	S. 10 17 34.9	13.687
	MONDAY 26.					WEDNESDAY 28.			
0	20 47 37.65	2.1549	S. 20 9 38.7	11.071	0	22 23 33.96	1.8709	S. 10 3 52.8	13.716
1	20 49 46.72	2.1474	19 58 31.9	11.156	1	22 25 26.09	1.8669	9 50 9.0	13.744
2	20 51 55.34	2.1399	19 47 20.0	11.240	2	22 27 17.99	1.8630	9 36 23.5	13.771
3	20 54 3.51	2.1324	19 36 3.1	11.322	3	22 29 9.65	1.8591	9 22 36.5	13.797
4	20 56 11.23	2.1251	19 24 41.4	11.402	4	22 31 1.08	1.8553	9 8 47.8	13.823
5	20 58 18.52	2.1178	19 13 14.9	11.481	5	22 32 52.29	1.8517	8 54 57.7	13.847
6	21 0 25.37	2.1106	19 1 43.7	11.559	6	22 34 43.28	1.8480	8 41 6.1	13.872
7	21 2 31.79	2.1034	18 50 7.8	11.636	7	22 36 34.05	1.8444	8 27 13.1	13.895
8	21 4 37.78	2.0963	18 38 27.4	11.710	8	22 38 24.61	1.8409	8 13 18.7	13.917
9	21 6 43.34	2.0892	18 26 42.6	11.783	9	22 40 14.96	1.8376	7 59 23.1	13.937
10	21 8 48.48	2.0822	18 14 53.4	11.857	10	22 42 5.12	1.8343	7 45 26.2	13.957
11	21 10 53.20	2.0753	18 2 59.8	11.927	11	22 43 55.08	1.8311	7 31 28.2	13.977
12	21 12 57.51	2.0684	17 51 2.1	11.997	12	22 45 44.85	1.8279	7 17 29.0	13.996
13	21 15 1.41	2.0617	17 39 0.2	12.065	13	22 47 34.43	1.8248	7 3 28.7	14.013
14	21 17 4.91	2.0549	17 26 54.3	12.132	14	22 49 23.83	1.8219	6 49 27.4	14.030
15	21 19 8.00	2.0483	17 14 44.4	12.197	15	22 51 13.06	1.8190	6 35 25.1	14.046
16	21 21 10.70	2.0417	17 2 30.6	12.262	16	22 53 2.11	1.8161	6 21 21.9	14.061
17	21 23 13.00	2.0351	16 50 13.0	12.325	17	22 54 50.99	1.8133	6 7 17.8	14.075
18	21 25 14.91	2.0287	16 37 51.6	12.387	18	22 56 39.71	1.8108	5 53 12.9	14.088
19	21 27 16.44	2.0223	16 25 26.5	12.448	19	22 58 28.28	1.8081	5 39 7.2	14.101
20	21 29 17.59	2.0160	16 12 57.8	12.507	20	23 0 16.68	1.8055	5 25 0.8	14.113
21	21 31 18.36	2.0098	16 0 25.6	12.566	21	23 2 4.94	1.8032	5 10 53.6	14.124
22	21 33 18.77	2.0037	15 47 49.9	12.622	22	23 3 53.06	1.8008	4 56 45.9	14.134
23	21 35 18.80	1.9975	15 35 10.9	12.678	23	23 5 41.04	1.7985	4 42 37.5	14.143
24	21 37 18.47	1.9915	S. 15 22 28.5	12.733	24	23 7 28.88	1.7963	S. 4 28 28.7	14.151

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	23 7 28.88	1.7963	S. 4 28 28.7	14.151
1	23 9 16.59	1.7942	4 14 19.4	14.159
2	23 11 4.18	1.7921	4 0 9.6	14.167
3	23 12 51.64	1.7901	3 45 59.4	14.173
4	23 14 38.99	1.7883	3 31 48.8	14.178
5	23 16 26.23	1.7864	3 17 38.0	14.182
6	23 18 13.36	1.7846	3 3 26.9	14.187
7	23 20 0.38	1.7829	2 49 15.6	14.189
8	23 21 47.31	1.7813	2 35 4.2	14.192
9	23 23 34.14	1.7798	2 20 52.6	14.193
10	23 25 20.89	1.7784	2 6 41.0	14.193
11	23 27 7.55	1.7770	1 52 29.4	14.193
12	23 28 54.13	1.7757	1 38 17.8	14.193
13	23 30 40.63	1.7744	1 24 6.2	14.192
14	23 32 27.06	1.7733	1 9 54.8	14.189
15	23 34 13.43	1.7723	0 55 43.5	14.186
16	23 35 59.73	1.7713	0 41 32.5	14.182
17	23 37 45.98	1.7703	0 27 21.7	14.177
18	23 39 32.17	1.7694	S. 0 13 11.2	14.172
19	23 41 18.31	1.7686	N. 0 0 58.9	14.166
20	23 43 4.40	1.7679	0 15 8.7	14.159
21	23 44 50.46	1.7673	0 29 18.0	14.152
22	23 46 36.48	1.7668	0 43 26.9	14.143
23	23 48 22.47	1.7663	N. 0 57 35.2	14.134

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	23 50 8.43	1.7658	N. 1 11 43.0	14.124
1	23 51 54.37	1.7655	1 25 50.1	14.113
2	23 53 40.29	1.7652	1 39 56.6	14.103
3	23 55 26.19	1.7649	1 54 2.5	14.091
4	23 57 12.08	1.7648	2 8 7.5	14.077
5	23 58 57.96	1.7647	2 22 11.8	14.064
6	0 0 43.84	1.7648	2 36 15.2	14.050
7	0 2 29.73	1.7648	2 50 17.8	14.036
8	0 4 15.62	1.7649	3 4 19.5	14.020
9	0 6 1.52	1.7652	3 18 20.2	14.002
10	0 7 47.44	1.7654	3 32 19.8	13.985
11	0 9 33.37	1.7658	3 46 18.4	13.967
12	0 11 19.33	1.7662	4 0 15.9	13.949
13	0 13 5.31	1.7667	4 14 12.3	13.929
14	0 14 51.33	1.7673	4 28 7.4	13.909
15	0 16 37.38	1.7678	4 42 1.4	13.889
16	0 18 23.47	1.7685	4 55 54.1	13.867
17	0 20 9.60	1.7693	5 9 45.5	13.845
18	0 21 55.78	1.7701	5 23 35.5	13.822
19	0 23 42.01	1.7709	5 37 24.1	13.798
20	0 25 28.29	1.7718	5 51 11.3	13.773
21	0 27 14.63	1.7729	6 4 56.9	13.747
22	0 29 1.04	1.7740	6 18 41.0	13.722
23	0 30 47.51	1.7751	6 32 23.5	13.695
24	0 32 34.05	1.7763	N. 6 46 4.4	13.667

SATURDAY 31.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	0 32 34.05	1.7763	N. 6 46 4.4	13.667
1	0 34 20.67	1.7776	6 59 43.6	13.639
2	0 36 7.36	1.7789	7 13 21.1	13.610
3	0 37 54.14	1.7803	7 26 56.8	13.580
4	0 39 41.00	1.7818	7 40 30.7	13.549
5	0 41 27.95	1.7833	7 54 2.7	13.518
6	0 43 15.00	1.7849	8 7 32.9	13.486
7	0 45 2.14	1.7865	8 21 1.0	13.452
8	0 46 49.38	1.7883	8 34 27.2	13.420
9	0 48 36.73	1.7900	8 47 51.4	13.386
10	0 50 24.18	1.7918	9 1 13.5	13.350
11	0 52 11.75	1.7938	9 14 33.4	13.313
12	0 53 59.43	1.7957	9 27 51.1	13.277
13	0 55 47.23	1.7978	9 41 6.6	13.239
14	0 57 35.16	1.7998	9 54 19.8	13.201
15	0 59 23.21	1.8019	10 7 30.7	13.162
16	1 1 11.39	1.8041	10 20 39.3	13.122
17	1 2 59.70	1.8063	10 33 45.4	13.082
18	1 4 48.15	1.8087	10 46 49.1	13.041
19	1 6 36.74	1.8110	10 59 50.3	12.998
20	1 8 25.47	1.8134	11 12 48.9	12.955
21	1 10 14.35	1.8159	11 25 44.9	12.911
22	1 12 3.38	1.8185	11 38 38.2	12.867
23	1 13 52.57	1.8211	N. 11 51 28.9	12.822

SUNDAY, NOVEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	1 15 41.91	1.8237	N. 12 4 16.8	12.775

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Oct.	3	17	58.9
☾	Last Quarter		11	21	33.1
●	New Moon		18	18	33.5
☽	First Quarter		25	10	44.0

			d	h
☾	Apogee	Oct.	6	5.1
☾	Perigee		19	3.8

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	14 23 21.77	9.771	S. 14 15 10.2	−48.41	16 9.02	66.83	16 18.73	0.084
Mon.	2	14 27 16.67	9.804	14 34 25.3	47.83	16 9.27	66.95	16 20.38	0.051
Tues.	3	14 31 12.38	9.838	14 53 26.3	47.23	16 9.52	67.06	16 21.22	0.018
Wed.	4	14 35 8.91	9.872	15 12 12.8	−46.62	16 9.77	67.18	16 21.24	0.016
Thur.	5	14 39 6.26	9.907	15 30 44.4	46.00	16 10.01	67.30	16 20.44	0.051
Frid.	6	14 43 4.45	9.942	15 49 0.8	45.36	16 10.25	67.42	16 18.82	0.086
Sat.	7	14 47 3.48	9.977	16 7 1.6	−44.70	16 10.48	67.53	16 16.36	0.121
SUN.	8	14 51 3.36	10.013	16 24 46.3	44.02	16 10.71	67.65	16 13.04	0.156
Mon.	9	14 55 4.11	10.049	16 42 14.5	43.32	16 10.94	67.77	16 8.87	0.192
Tues.	10	14 59 5.71	10.085	16 59 25.8	−42.61	16 11.17	67.89	16 3.84	0.228
Wed.	11	15 3 8.18	10.121	17 16 19.9	41.88	16 11.39	68.01	15 57.94	0.264
Thur.	12	15 7 11.52	10.157	17 32 56.3	41.14	16 11.61	68.13	15 51.17	0.301
Frid.	13	15 11 15.74	10.193	17 49 14.5	−40.37	16 11.83	68.25	15 43.53	0.337
Sat.	14	15 15 20.82	10.229	18 5 14.2	39.59	16 12.04	68.37	15 35.02	0.373
SUN.	15	15 19 26.78	10.265	18 20 55.0	38.79	16 12.25	68.48	15 25.64	0.409
Mon.	16	15 23 33.60	10.301	18 36 16.5	−37.98	16 12.46	68.60	15 15.40	0.444
Tues.	17	15 27 41.27	10.337	18 51 18.3	37.15	16 12.67	68.72	15 4.32	0.479
Wed.	18	15 31 49.79	10.372	19 5 59.8	36.30	16 12.87	68.83	14 52.40	0.514
Thur.	19	15 35 59.13	10.407	19 20 20.8	−35.44	16 13.08	68.95	14 39.64	0.548
Frid.	20	15 40 9.30	10.441	19 34 20.8	34.56	16 13.28	69.06	14 26.07	0.582
Sat.	21	15 44 20.28	10.474	19 47 59.4	33.66	16 13.48	69.18	14 11.70	0.615
SUN.	22	15 48 32.05	10.507	20 1 16.3	−32.75	16 13.68	69.29	13 56.53	0.648
Mon.	23	15 52 44.61	10.539	20 14 11.3	31.82	16 13.87	69.40	13 40.58	0.680
Tues.	24	15 56 57.93	10.571	20 26 43.8	30.88	16 14.06	69.50	13 23.86	0.712
Wed.	25	16 1 12.01	10.602	20 38 53.5	−29.93	16 14.25	69.61	13 6.39	0.743
Thur.	26	16 5 26.83	10.633	20 50 40.1	28.96	16 14.44	69.71	12 48.18	0.774
Frid.	27	16 9 42.38	10.663	21 2 3.4	27.98	16 14.62	69.82	12 29.24	0.804
Sat.	28	16 13 58.64	10.692	21 13 2.9	−26.98	16 14.80	69.92	12 9.58	0.834
SUN.	29	16 18 15.61	10.721	21 23 38.4	25.97	16 14.97	70.02	11 49.22	0.863
Mon.	30	16 22 33.26	10.749	21 33 49.5	24.95	16 15.13	70.11	11 28.18	0.891
Tues.	31	16 26 51.59	10.777	S. 21 43 36.1	−23.93	16 15.29	70.20	11 6.47	0.918

Note.—The mean time of semidiameter passing meridian may be found by subtracting $0^s.19$ from the sidereal time. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	14 23 24.43	9.772	S. 14 15 23.4	−48.41	16 18.74	0.084	14 39 43.18
Mon.	2	14 27 19.35	9.805	14 34 38.4	47.83	16 20.38	0.051	14 43 39.73
Tues.	3	14 31 15.07	9.839	14 53 39.2	47.23	16 21.22	0.018	14 47 36.29
Wed.	4	14 35 11.60	9.873	15 12 25.6	−46.62	16 21.24	0.016	14 51 32.84
Thur.	5	14 39 8.96	9.907	15 30 57.1	45.99	16 20.43	0.051	14 55 29.40
Frid.	6	14 43 7.15	9.942	15 49 13.2	45.35	16 18.79	0.086	14 59 25.96
Sat.	7	14 47 6.18	9.977	16 7 13.7	−44.69	16 16.32	0.121	15 3 22.51
SUN.	8	14 51 6.06	10.013	16 24 58.2	44.01	16 13.00	0.156	15 7 19.07
Mon.	9	14 55 6.80	10.049	16 42 26.1	43.31	16 8.82	0.192	15 11 15.62
Tues.	10	14 59 8.40	10.085	16 59 37.2	−42.60	16 3.78	0.228	15 15 12.18
Wed.	11	15 3 10.87	10.121	17 16 31.0	41.87	15 57.87	0.264	15 19 8.74
Thur.	12	15 7 14.21	10.157	17 33 7.1	41.13	15 51.09	0.301	15 23 5.30
Frid.	13	15 11 18.42	10.193	17 49 25.1	−40.36	15 43.44	0.337	15 27 1.85
Sat.	14	15 15 23.49	10.229	18 5 24.5	39.58	15 34.92	0.373	15 30 58.41
SUN.	15	15 19 29.43	10.265	18 21 5.0	38.78	15 25.53	0.409	15 34 54.96
Mon.	16	15 23 36.23	10.301	18 36 26.2	−37.97	15 15.29	0.444	15 38 51.52
Tues.	17	15 27 43.88	10.336	18 51 27.6	37.14	15 4.20	0.479	15 42 48.08
Wed.	18	15 31 52.37	10.371	19 6 8.8	36.29	14 52.27	0.514	15 46 44.64
Thur.	19	15 36 1.69	10.405	19 20 29.4	−35.42	14 39.51	0.548	15 50 41.19
Frid.	20	15 40 11.82	10.439	19 34 29.1	34.54	14 25.93	0.582	15 54 37.75
Sat.	21	15 44 22.76	10.472	19 48 7.4	33.64	14 11.55	0.615	15 58 34.31
SUN.	22	15 48 34.49	10.505	20 1 24.0	−32.73	13 56.38	0.648	16 2 30.86
Mon.	23	15 52 47.00	10.537	20 14 18.6	31.80	13 40.42	0.680	16 6 27.42
Tues.	24	15 57 0.28	10.569	20 26 50.7	30.86	13 23.70	0.712	16 10 23.98
Wed.	25	16 1 14.31	10.600	20 39 0.0	−29.91	13 6.23	0.743	16 14 20.54
Thur.	26	16 5 29.08	10.631	20 50 46.3	28.94	12 48.02	0.774	16 18 17.10
Frid.	27	16 9 44.58	10.661	21 2 9.2	27.96	12 29.07	0.804	16 22 13.66
Sat.	28	16 14 0.80	10.690	21 13 8.3	−26.96	12 9.41	0.834	16 26 10.21
SUN.	29	16 18 17.72	10.719	21 23 43.5	25.95	11 49.05	0.863	16 30 6.77
Mon.	30	16 22 35.32	10.747	21 33 54.3	24.93	11 28.01	0.891	16 34 3.33
Tues.	31	16 26 53.59	10.775	S. 21 43 40.5	−23.91	11 6.30	0.918	16 37 59.89

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,
$+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	Diff. for 1 Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	305	218 13 55.4	13 7.0	150.09	+0.32	9.996 6143	−47.2	9 18 45.04
2	306	219 13 58.4	13 9.9	150.16	0.38	9.996 5017	46.6	9 14 49.13
3	307	220 14 3.2	13 14.6	150.24	0.42	9.996 3907	45.9	9 10 53.22
4	308	221 14 9.9	13 21.1	150.32	+0.45	9.996 2813	−45.3	9 6 57.31
5	309	222 14 18.5	13 29.6	150.40	0.45	9.996 1735	44.6	9 3 1.40
6	310	223 14 29.0	13 39.9	150.48	0.42	9.996 0672	44.0	8 59 5.49
7	311	224 14 41.5	13 52.2	150.56	+0.36	9.995 9625	−43.3	8 55 9.58
8	312	225 14 55.9	14 6.5	150.64	0.27	9.995 8593	42.7	8 51 13.66
9	313	226 15 12.3	14 22.8	150.73	0.17	9.995 7575	42.1	8 47 17.75
10	314	227 15 30.7	14 41.0	150.81	+0.06	9.995 6573	−41.5	8 43 21.84
11	315	228 15 51.1	15 1.3	150.89	−0.08	9.995 5583	41.0	8 39 25.93
12	316	229 16 13.5	15 23.5	150.97	0.20	9.995 4605	40.5	8 35 30.02
13	317	230 16 37.9	15 47.8	151.05	−0.33	9.995 3639	−40.0	8 31 34.11
14	318	231 17 4.2	16 13.9	151.13	0.45	9.995 2683	39.6	8 27 38.20
15	319	232 17 32.4	16 41.9	151.21	0.55	9.995 1736	39.2	8 23 42.29
16	320	233 18 2.3	17 11.6	151.28	−0.62	9.995 0797	−38.9	8 19 46.38
17	321	234 18 33.9	17 43.0	151.35	0.66	9.994 9866	38.6	8 15 50.46
18	322	235 19 7.0	18 16.0	151.41	0.66	9.994 8943	38.3	8 11 54.55
19	323	236 19 41.7	18 50.5	151.47	−0.62	9.994 8029	−37.9	8 7 58.64
20	324	237 20 17.7	19 26.3	151.53	0.58	9.994 7124	37.5	8 4 2.73
21	325	238 20 54.9	20 3.4	151.58	0.49	9.994 6228	37.0	8 0 6.82
22	326	239 21 33.4	20 41.7	151.63	−0.38	9.994 5345	−36.5	7 56 10.91
23	327	240 22 13.0	21 21.2	151.67	0.26	9.994 4476	35.9	7 52 15.00
24	328	241 22 53.8	22 1.7	151.72	−0.13	9.994 3622	35.2	7 48 19.09
25	329	242 23 35.6	22 43.3	151.76	0.00	9.994 2784	−34.5	7 44 23.18
26	330	243 24 18.4	23 26.0	151.81	+0.12	9.994 1966	33.7	7 40 27.26
27	331	244 25 2.4	24 9.8	151.85	0.24	9.994 1166	32.9	7 36 31.35
28	332	245 25 47.4	24 54.6	151.90	+0.34	9.994 0387	−32.0	7 32 35.44
29	333	246 26 33.5	25 40.5	151.94	0.40	9.993 9630	31.1	7 28 39.52
30	334	247 27 20.6	26 27.5	151.99	0.47	9.993 8895	30.1	7 24 43.61
31	335	248 28 8.9	27 15.6	152.05	+0.49	9.993 8184	−29 1	7 20 47.70

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour, $-9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 44.7	14 43.9	54 0.95	−0.291	53 58.14	−0.179	10 54.2	1.74	13.2
2	14 43.5	14 43.4	53 56.65	−0.070	53 56.45	+0.038	11 37.2	1.84	14.2
3	14 43.7	14 44.4	53 57.55	+0.145	53 59.93	0.253	12 22.7	1.95	15.2
4	14 45.4	14 46.8	54 3.63	+0.365	54 8.71	+0.481	13 11.0	2.07	16.2
5	14 48.6	14 50.7	54 15.20	0.601	54 23.15	0.725	14 1.9	2.16	17.2
6	14 53.3	14 56.3	54 32.64	0.858	54 43.77	0.998	14 54.4	2.20	18.2
7	14 59.8	15 3.8	54 56.60	+1.141	55 11.17	+1.288	15 47.2	2.19	19.2
8	15 8.3	15 13.2	55 27.53	1.439	55 45.70	1.590	16 39.1	2.14	20.2
9	15 18.7	15 24.6	56 5.66	1.737	56 27.35	1.876	17 29.5	2.07	21.2
10	15 30.9	15 37.6	56 50.63	+2.002	57 15.34	+2.113	18 18.3	2.00	22.2
11	15 44.7	15 52.0	57 41.26	2.201	58 8.04	2.257	19 5.9	1.97	23.2
12	15 59.4	16 6.8	58 35.27	2.274	59 2.44	2.247	19 53.4	1.99	24.2
13	16 14.1	16 21.0	59 29.00	+2.171	59 54.32	+2.038	20 42.0	2.07	25.2
14	16 27.3	16 33.0	60 17.68	1.846	60 38.40	1.598	21 33.2	2.21	26.2
15	16 37.7	16 41.4	60 55.81	1.294	61 9.25	0.940	22 28.4	2.40	27.2
16	16 43.8	16 45.0	61 18.22	+0.550	61 22.35	+0.135	23 28.3	2.59	28.2
17	16 44.7	16 43.1	61 21.41	−0.291	61 15.38	−0.711	☌	. .	29.2
18	16 40.1	16 35.8	61 4.44	1.107	60 48.96	1.466	0 32.4	2.73	0.8
19	16 30.5	16 24.3	60 29.44	−1.778	60 6.52	−2.033	1 38.4	2.74	1.8
20	16 17.3	16 9.8	59 40.89	2.227	59 13.31	2.359	2 42.9	2.61	2.8
21	16 1.9	15 53.9	58 44.50	2.432	58 15.16	2.448	3 43.1	2.39	3.8
22	15 46.0	15 38.2	57 45.94	−2.415	57 17.37	−2.340	4 37.5	2.15	4.8
23	15 30.7	15 23.6	56 49.92	2.229	56 23.98	2.089	5 26.5	1.94	5.8
24	15 17.1	15 11.0	55 59.86	1.927	55 37.78	1.750	6 11.1	1.79	6.8
25	15 5.6	15 0.8	55 17.89	−1.563	55 0.29	−1.370	6 52.7	1.69	7.8
26	14 56.7	14 53.1	54 45.01	1.176	54 32.05	0.984	7 32.7	1.65	8.8
27	14 50.2	14 47.9	54 21.39	0.795	54 12.95	0.613	8 12.4	1.66	9.8
28	14 46.2	14 45.0	54 6.63	−0.442	54 2.30	−0.280	8 52.8	1.71	10.8
29	14 44.4	14 44.2	53 59.88	−0.126	53 59.24	+0.016	9 34.9	1.80	11.8
30	14 44.5	14 45.2	54 0.22	+0.146	54 2.71	0.266	10 19.6	1.92	12.8
31	14 46.2	14 47.6	54 6.58	+0.377	54 11.73	+0.480	11 7.3	2.05	13.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 1.			
	h m s	s	° ′ ″	″
0	1 15 41.91	1.8237	N. 12 4 16.8	12.775
1	1 17 31.41	1.8263	12 17 1.9	12.728
2	1 19 21.07	1.8292	12 29 44.2	12.681
3	1 21 10.91	1.8320	12 42 23.6	12.632
4	1 23 0.91	1.8348	12 55 0.1	12.582
5	1 24 51.09	1.8378	13 7 33.5	12.532
6	1 26 41.44	1.8407	13 20 3.9	12.482
7	1 28 31.97	1.8437	13 32 31.3	12.430
8	1 30 22.68	1.8467	13 44 55.5	12.377
9	1 32 13.57	1.8498	13 57 16.5	12.323
10	1 34 4.66	1.8530	14 9 34.3	12.269
11	1 35 55.93	1.8562	14 21 48.8	12.214
12	1 37 47.40	1.8595	14 34 0.0	12.158
13	1 39 39.07	1.8628	14 46 7.8	12.101
14	1 41 30.94	1.8662	14 58 12.1	12.042
15	1 43 23.01	1.8695	15 10 12.9	11.985
16	1 45 15.28	1.8730	15 22 10.3	11.926
17	1 47 7.77	1.8765	15 34 4.0	11.865
18	1 49 0.46	1.8800	15 45 54.1	11.804
19	1 50 53.37	1.8837	15 57 40.5	11.742
20	1 52 46.50	1.8873	16 9 23.1	11.679
21	1 54 39.84	1.8909	16 21 2.0	11.616
22	1 56 33.41	1.8947	16 32 37.0	11.551
23	1 58 27.20	1.8983	N. 16 44 8.1	11.486
	MONDAY 2.			
0	2 0 21.21	1.9021	N. 16 55 35.3	11.420
1	2 2 15.45	1.9059	17 6 58.5	11.352
2	2 4 9.92	1.9098	17 18 17.6	11.284
3	2 6 4.63	1.9138	17 29 32.6	11.216
4	2 7 59.57	1.9177	17 40 43.5	11.146
5	2 9 54.75	1.9217	17 51 50.1	11.075
6	2 11 50.17	1.9256	18 2 52.5	11.004
7	2 13 45.82	1.9296	18 13 50.6	10.932
8	2 15 41.72	1.9338	18 24 44.3	10.858
9	2 17 37.87	1.9379	18 35 33.6	10.784
10	2 19 34.27	1.9421	18 46 18.4	10.710
11	2 21 30.92	1.9462	18 56 58.8	10.634
12	2 23 27.81	1.9503	19 7 34.5	10.557
13	2 25 24.96	1.9546	19 18 5.6	10.479
14	2 27 22.36	1.9588	19 28 32.0	10.401
15	2 29 20.02	1.9631	19 38 53.7	10.321
16	2 31 17.93	1.9673	19 49 10.5	10.240
17	2 33 16.10	1.9718	19 59 22.5	10.159
18	2 35 14.54	1.9762	20 9 29.6	10.077
19	2 37 13.24	1.9805	20 19 31.8	9.995
20	2 39 12.20	1.9848	20 29 29.0	9.911
21	2 41 11.42	1.9893	20 39 21.1	9.825
22	2 43 10.91	1.9937	20 49 8.0	9.739
23	2 45 10.66	1.9981	20 58 49.8	9.653
24	2 47 10.68	2.0026	N. 21 8 26.4	9.566

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Di 1 M
	TUESDAY 3.			
	h m s	s	° ′ ″	″
0	2 47 10.68	2.0026	N. 21 8 26.4	9.
1	2 49 10.97	2.0071	21 17 57.7	9.
2	2 51 11.53	2.0115	21 27 23.6	9.
3	2 53 12.35	2.0160	21 36 44.2	9.
4	2 55 13.45	2.0206	21 45 59.3	9.
5	2 57 14.82	2.0250	21 55 8.9	9.
6	2 59 16.45	2.0295	22 4 13.0	9.
7	3 1 18.36	2.0341	22 13 11.5	8.
8	3 3 20.54	2.0387	22 22 4.2	8.
9	3 5 23.00	2.0432	22 30 51.3	8.
10	3 7 25.72	2.0477	22 39 32.6	8.
11	3 9 28.72	2.0523	22 48 8.1	8.
12	3 11 31.99	2.0568	22 56 37.7	8.4
13	3 13 35.53	2.0613	23 5 1.4	8.3
14	3 15 39.35	2.0659	23 13 19.1	8.2
15	3 17 43.44	2.0703	23 21 30.8	8.1
16	3 19 47.79	2.0748	23 29 36.4	8.0
17	3 21 52.42	2.0794	23 37 35.9	7.9
18	3 23 57.32	2.0839	23 45 29.1	7.8
19	3 26 2.49	2.0884	23 53 16.1	7.7
20	3 28 7.93	2.0928	24 0 56.9	7.6
21	3 30 13.63	2.0973	24 8 31.3	7.5
22	3 32 19.60	2.1018	24 15 59.3	7.4
23	3 34 25.84	2.1063	N. 24 23 20.8	7.3
	WEDNESDAY 4.			
0	3 36 32.35	2.1107	N. 24 30 35.8	7.19
1	3 38 39.12	2.1150	24 37 44.3	7.0
2	3 40 46.15	2.1194	24 44 46.2	6.97
3	3 42 53.45	2.1238	24 51 41.4	6.86
4	3 45 1.01	2.1281	24 58 30.0	6.75
5	3 47 8.82	2.1323	25 5 11.8	6.64
6	3 49 16.89	2.1367	25 11 46.8	6.52
7	3 51 25.22	2.1409	25 18 14.9	6.41
8	3 53 33.80	2.1452	25 24 36.1	6.29
9	3 55 42.64	2.1493	25 30 50.4	6.18
10	3 57 51.72	2.1534	25 36 57.7	6.06
11	4 0 1.05	2.1576	25 42 57.9	5.94
12	4 2 10.63	2.1617	25 48 51.1	5.82
13	4 4 20.45	2.1657	25 54 37.1	5.70
14	4 6 30.51	2.1697	26 0 15.9	5.58
15	4 8 40.81	2.1737	26 5 47.5	5.46
16	4 10 51.35	2.1776	26 11 11.8	5.34
17	4 13 2.12	2.1814	26 16 28.8	5.22
18	4 15 13.12	2.1853	26 21 38.5	5.09
19	4 17 24.35	2.1890	26 26 40.7	4.97
20	4 19 35.80	2.1927	26 31 35.5	4.85
21	4 21 47.47	2.1963	26 36 22.8	4.72
22	4 23 59.36	2.2000	26 41 2.6	4.60
23	4 26 11.47	2.2036	26 45 34.8	4.473
24	4 28 23.79	2.2071	N. 26 49 59.4	4.346

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 5.			
	h m s	s	° ′ ″	″
0	4 28 23.79	2.2071	N. 26 49 59.4	4.346
1	4 30 36.32	2.2105	26 54 16.3	4.218
2	4 32 49.05	2.2139	26 58 25.6	4.090
3	4 35 1.99	2.2173	27 2 27.1	3.961
4	4 37 15.12	2.2205	27 6 20.9	3.832
5	4 39 28.45	2.2238	27 10 6.9	3.701
6	4 41 41.97	2.2268	27 13 45.0	3.569
7	4 43 55.67	2.2299	27 17 15.2	3.437
8	4 46 9.56	2.2330	27 20 37.5	3.306
9	4 48 23.63	2.2360	27 23 51.9	3.173
10	4 50 37.88	2.2388	27 26 58.3	3.040
11	4 52 52.29	2.2416	27 29 56.7	2.907
12	4 55 6.87	2.2443	27 32 47.1	2.772
13	4 57 21.61	2.2470	27 35 29.4	2.637
14	4 59 36.51	2.2496	27 38 3.6	2.502
15	5 1 51.56	2.2521	27 40 29.6	2.366
16	5 4 6.76	2.2546	27 42 47.5	2.230
17	5 6 22.11	2.2570	27 44 57.2	2.093
18	5 8 37.60	2.2593	27 46 58.7	1.956
19	5 10 53.22	2.2614	27 48 51.9	1.818
20	5 13 8.97	2.2636	27 50 36.9	1.681
21	5 15 24.85	2.2657	27 52 13.6	1.542
22	5 17 40.85	2.2677	27 53 42.0	1.403
23	5 19 56.97	2.2696	N. 27 55 2.0	1.264
	FRIDAY 6.			
0	5 22 13.20	2.2714	N. 27 56 13.7	1.125
1	5 24 29.54	2.2732	27 57 17.0	0.985
2	5 26 45.98	2.2748	27 58 11.9	0.845
3	5 29 2.52	2.2764	27 58 58.4	0.705
4	5 31 19.15	2.2778	27 59 36.5	0.564
5	5 33 35.86	2.2793	28 0 6.1	0.422
6	5 35 52.66	2.2807	28 0 27.2	0.282
7	5 38 9.54	2.2819	28 0 39.9	+0.141
8	5 40 26.49	2.2831	28 0 44.1	−0.002
9	5 42 43.51	2.2841	28 0 39.7	0.143
10	5 45 0.58	2.2851	28 0 26.9	0.285
11	5 47 17.72	2.2861	28 0 5.5	0.427
12	5 49 34.91	2.2868	27 59 35.6	0.570
13	5 51 52.14	2.2876	27 58 57.1	0.712
14	5 54 9.42	2.2883	27 58 10.1	0.855
15	5 56 26.73	2.2888	27 57 14.5	0.998
16	5 58 44.07	2.2893	27 56 10.3	1.141
17	6 1 1.44	2.2897	27 54 57.6	1.283
18	6 3 18.83	2.2900	27 53 36.3	1.427
19	6 5 36.24	2.2903	27 52 6.4	1.570
20	6 7 53.66	2.2904	27 50 27.9	1.712
21	6 10 11.09	2.2905	27 48 40.9	1.856
22	6 12 28.52	2.2904	27 46 45.2	1.999
23	6 14 45.94	2.2903	27 44 41.0	2.142
24	6 17 3.36	2.2902	N. 27 42 28.2	2.285

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 7.			
	h m s	s	° ′ ″	″
0	6 17 3.36	2.2902	N. 27 42 28.2	2.285
1	6 19 20.76	2.2899	27 40 6.8	2.428
2	6 21 38.15	2.2896	27 37 36.8	2.571
3	6 23 55.51	2.2892	27 34 58.3	2.713
4	6 26 12.85	2.2887	27 32 11.2	2.857
5	6 28 30.15	2.2881	27 29 15.5	2.999
6	6 30 47.42	2.2875	27 26 11.3	3.141
7	6 33 4.65	2.2868	27 22 58.6	3.283
8	6 35 21.83	2.2859	27 19 37.3	3.426
9	6 37 38.96	2.2851	27 16 7.5	3.568
10	6 39 56.04	2.2842	27 12 29.1	3.710
11	6 42 13.06	2.2831	27 8 42.3	3.851
12	6 44 30.01	2.2820	27 4 47.0	3.992
13	6 46 46.90	2.2808	27 0 43.2	4.133
14	6 49 3.71	2.2796	26 56 31.0	4.274
15	6 51 20.45	2.2783	26 52 10.3	4.415
16	6 53 37.11	2.2769	26 47 41.2	4.555
17	6 55 53.68	2.2755	26 43 3.7	4.695
18	6 58 10.17	2.2741	26 38 17.8	4.835
19	7 0 26.57	2.2725	26 33 23.5	4.974
20	7 2 42.87	2.2708	26 28 20.9	5.112
21	7 4 59.07	2.2692	26 23 10.0	5.252
22	7 7 15.17	2.2675	26 17 50.7	5.390
23	7 9 31.17	2.2657	N. 26 12 23.2	5.527
	SUNDAY 8.			
0	7 11 47.05	2.2638	N. 26 6 47.4	5.665
1	7 14 2.82	2.2619	26 1 3.4	5.802
2	7 16 18.48	2.2600	25 55 11.2	5.938
3	7 18 34.02	2.2580	25 49 10.8	6.075
4	7 20 49.44	2.2559	25 43 2.2	6.211
5	7 23 4.73	2.2538	25 36 45.5	6.346
6	7 25 19.90	2.2518	25 30 20.7	6.481
7	7 27 34.94	2.2495	25 23 47.8	6.615
8	7 29 49.84	2.2473	25 17 6.9	6.748
9	7 32 4.61	2.2450	25 10 18.0	6.882
10	7 34 19.24	2.2427	25 3 21.0	7.016
11	7 36 33.73	2.2403	24 56 16.1	7.147
12	7 38 48.08	2.2380	24 49 3.3	7.279
13	7 41 2.29	2.2356	24 41 42.6	7.411
14	7 43 16.35	2.2331	24 34 14.0	7.542
15	7 45 30.26	2.2306	24 26 37.6	7.672
16	7 47 44.02	2.2281	24 18 53.4	7.801
17	7 49 57.63	2.2256	24 11 1.5	7.929
18	7 52 11.09	2.2230	24 3 1.9	8.057
19	7 54 24.39	2.2204	23 54 54.6	8.186
20	7 56 37.54	2.2178	23 46 39.6	8.313
21	7 58 50.53	2.2152	23 38 17.0	8.440
22	8 1 3.36	2.2125	23 29 46.8	8.566
23	8 3 16.03	2.2098	23 21 9.1	8.691
24	8 5 28.54	2.2072	N. 23 12 23.9	8.815

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 9.					WEDNESDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 5 28.54	2.2072	N. 23 12 23.9	8.815	0	9 48 26.55	2.0926	N. 13 59 46.9	13.896
1	8 7 40.89	2.2045	23 3 31.3	8.939	1	9 50 32.06	2.0912	13 45 50.6	13.981
2	8 9 53.08	2.2018	22 54 31.2	9.062	2	9 52 37.49	2.0898	13 31 49.2	14.065
3	8 12 5.11	2.1991	22 45 23.8	9.185	3	9 54 42.83	2.0884	13 17 42.8	14.147
4	8 14 16.97	2.1963	22 36 9.0	9.307	4	9 56 48.10	2.0871	13 3 31.5	14.229
5	8 16 28.67	2.1937	22 26 46.9	9.428	5	9 58 53.28	2.0858	12 49 15.3	14.310
6	8 18 40.21	2.1909	22 17 17.6	9.548	6	10 0 58.39	2.0847	12 34 54.3	14.390
7	8 20 51.58	2.1881	22 7 41.1	9.668	7	10 3 3.44	2.0835	12 20 28.5	14.468
8	8 23 2.78	2.1854	21 57 57.4	9.787	8	10 5 8.41	2.0824	12 5 58.1	14.546
9	8 25 13.83	2.1828	21 48 6.6	9.906	9	10 7 13.33	2.0815	11 51 23.0	14.623
10	8 27 24.71	2.1799	21 38 8.7	10.024	10	10 9 18.19	2.0805	11 36 43.3	14.699
11	8 29 35.42	2.1772	21 28 3.7	10.141	11	10 11 22.99	2.0796	11 21 59.1	14.773
12	8 31 45.97	2.1745	21 17 51.8	10.257	12	10 13 27.74	2.0788	11 7 10.5	14.847
13	8 33 56.36	2.1718	21 7 32.9	10.372	13	10 15 32.44	2.0781	10 52 17.5	14.920
14	8 36 6.58	2.1690	20 57 7.1	10.487	14	10 17 37.11	2.0774	10 37 20.1	14.992
15	8 38 16.64	2.1663	20 46 34.5	10.601	15	10 19 41.73	2.0768	10 22 18.5	15.062
16	8 40 26.53	2.1636	20 35 55.0	10.714	16	10 21 46.33	2.0763	10 7 12.7	15.131
17	8 42 36.27	2.1609	20 25 8.8	10.826	17	10 23 50.89	2.0758	9 52 2.8	15.199
18	8 44 45.84	2.1583	20 14 15.9	10.937	18	10 25 55.43	2.0755	9 36 48.8	15.267
19	8 46 55.26	2.1557	20 3 16.3	11.049	19	10 27 59.95	2.0752	9 21 30.8	15.333
20	8 49 4.52	2.1530	19 52 10.0	11.160	20	10 30 4.45	2.0749	9 6 8.8	15.398
21	8 51 13.62	2.1504	19 40 57.1	11.269	21	10 32 8.94	2.0748	8 50 43.0	15.462
22	8 53 22.57	2.1478	19 29 37.7	11.377	22	10 34 13.43	2.0748	8 35 13.4	15.525
23	8 55 31.36	2.1453	N. 19 18 11.9	11.484	23	10 36 17.91	2.0747	N. 8 19 40.0	15.587
	TUESDAY 10.					THURSDAY 12.			
0	8 57 40.00	2.1427	N. 19 6 39.6	11.592	0	10 38 22.39	2.0748	N. 8 4 3.0	15.647
1	8 59 48.48	2.1402	18 55 0.9	11.697	1	10 40 26.88	2.0749	7 48 22.4	15.706
2	9 1 56.82	2.1378	18 43 15.9	11.802	2	10 42 31.38	2.0751	7 32 38.3	15.765
3	9 4 5.01	2.1353	18 31 24.6	11.907	3	10 44 35.89	2.0754	7 16 50.6	15.822
4	9 6 13.05	2.1328	18 19 27.0	12.011	4	10 46 40.43	2.0758	7 0 59.6	15.877
5	9 8 20.95	2.1304	18 7 23.3	12.112	5	10 48 44.99	2.0763	6 45 5.3	15.932
6	9 10 28.70	2.1281	17 55 13.5	12.215	6	10 50 49.58	2.0768	6 29 7.7	15.986
7	9 12 36.32	2.1258	17 42 57.5	12.317	7	10 52 54.21	2.0775	6 13 7.0	16.037
8	9 14 43.79	2.1234	17 30 35.5	12.416	8	10 54 58.88	2.0782	5 57 3.2	16.090
9	9 16 51.13	2.1212	17 18 7.6	12.515	9	10 57 3.59	2.0789	5 40 56.2	16.140
10	9 18 58.34	2.1190	17 5 33.7	12.613	10	10 59 8.35	2.0798	5 24 46.4	16.187
11	9 21 5.41	2.1168	16 52 54.0	12.711	11	11 1 13.17	2.0808	5 8 33.7	16.235
12	9 23 12.35	2.1147	16 40 8.4	12.808	12	11 3 18.05	2.0818	4 52 18.2	16.282
13	9 25 19.17	2.1126	16 27 17.0	12.903	13	11 5 22.99	2.0830	4 35 59.9	16.327
14	9 27 25.86	2.1105	16 14 20.0	12.997	14	11 7 28.01	2.0843	4 19 39.0	16.369
15	9 29 32.43	2.1085	16 1 17.3	13.092	15	11 9 33.10	2.0856	4 3 15.6	16.412
16	9 31 38.88	2.1065	15 48 9.0	13.185	16	11 11 38.28	2.0870	3 46 49.6	16.453
17	9 33 45.21	2.1047	15 34 55.1	13.277	17	11 13 43.54	2.0884	3 30 21.2	16.492
18	9 35 51.44	2.1028	15 21 35.7	13.368	18	11 15 48.89	2.0900	3 13 50.5	16.530
19	9 37 57.55	2.1009	15 8 10.9	13.459	19	11 17 54.34	2.0916	2 57 17.6	16.567
20	9 40 3.55	2.0992	14 54 40.6	13.549	20	11 19 59.88	2.0933	2 40 42.5	16.603
21	9 42 9.45	2.0975	14 41 5.0	13.637	21	11 22 5.54	2.0953	2 24 5.2	16.637
22	9 44 15.25	2.0958	14 27 24.2	13.724	22	11 24 11.31	2.0972	2 7 26.0	16.670
23	9 46 20.95	2.0942	14 13 38.1	13.811	23	11 26 17.20	2.0992	1 50 44.8	16.702
24	9 48 26.55	2.0926	N. 13 59 46.9	13.896	24	11 28 23.21	2.1013	N. 1 34 1.8	16.731

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 13.

Hour.	Right Ascension.	Diff. for 1 Min.		Declination.	Diff. for 1 Min.
	h m s	s		° ′ ″	″
0	11 28 23.21	2.1013	N.	1 34 1.8	16.731
1	11 30 29.35	2.1034		1 17 17.1	16.759
2	11 32 35.62	2.1058		1 0 30.7	16.787
3	11 34 42.04	2.1082		0 43 42.7	16.812
4	11 36 48.60	2.1106		0 26 53.2	16.837
5	11 38 55.31	2.1131	N.	0 10 2.3	16.858
6	11 41 2.17	2.1158	S.	0 6 49.8	16.879
7	11 43 9.20	2.1185		0 23 43.2	16.899
8	11 45 16.39	2.1213		0 40 37.7	16.917
9	11 47 23.76	2.1243		0 57 33.3	16.934
10	11 49 31.31	2.1273		1 14 29.8	16.948
11	11 51 39.04	2.1304		1 31 27.1	16.962
12	11 53 46.96	2.1336		1 48 25.2	16.973
13	11 55 55.07	2.1368		2 5 23.9	16.983
14	11 58 3.38	2.1403		2 22 23.2	16.992
15	12 0 11.90	2.1438		2 39 22.9	16.998
16	12 2 20.64	2.1474		2 56 23.0	17.003
17	12 4 29.59	2.1510		3 13 23.3	17.007
18	12 6 38.76	2.1548		3 30 23.8	17.008
19	12 8 48.16	2.1586		3 47 24.3	17.008
20	12 10 57.79	2.1625		4 4 24.8	17.007
21	12 13 7.66	2.1666		4 21 25.2	17.004
22	12 15 17.78	2.1708		4 38 25.3	16.998
23	12 17 28.15	2.1750	S.	4 55 25.0	16.991

SATURDAY 14.

Hour.	Right Ascension.	Diff. for 1 Min.		Declination.	Diff. for 1 Min.
0	12 19 38.78	2.1793	S.	5 12 24.2	16.982
1	12 21 49.67	2.1837		5 29 22.9	16.972
2	12 24 0.82	2.1882		5 46 20.8	16.958
3	12 26 12.25	2.1928		6 3 17.9	16.944
4	12 28 23.96	2.1975		6 20 14.1	16.928
5	12 30 35.95	2.2023		6 37 9.3	16.910
6	12 32 48.23	2.2071		6 54 3.3	16.890
7	12 35 0.80	2.2120		7 10 56.1	16.868
8	12 37 13.67	2.2170		7 27 47.5	16.844
9	12 39 26.84	2.2222		7 44 37.4	16.818
10	12 41 40.33	2.2274		8 1 25.7	16.791
11	12 43 54.13	2.2327		8 18 12.3	16.761
12	12 46 8.25	2.2380		8 34 57.0	16.729
13	12 48 22.69	2.2435		8 51 39.8	16.695
14	12 50 37.47	2.2491		9 8 20.4	16.659
15	12 52 52.58	2.2547		9 24 58.9	16.622
16	12 55 8.03	2.2604		9 41 35.0	16.582
17	12 57 23.83	2.2663		9 58 8.7	16.540
18	12 59 39.98	2.2721		10 14 39.8	16.495
19	13 1 56.48	2.2780		10 31 8.1	16.448
20	13 4 13.34	2.2841		10 47 33.6	16.400
21	13 6 30.57	2.2902		11 3 56.1	16.350
22	13 8 48.16	2.2963		11 20 15.6	16.297
23	13 11 6.13	2.3027		11 36 31.8	16.242
24	13 13 24.48	2.3090	S.	11 52 44.6	16.185

SUNDAY 15.

Hour.	Right Ascension.	Diff. for 1 Min.		Declination.	Diff. for 1 Min.
	h m s	s		° ′ ″	″
0	13 13 24.48	2.3090	S.	11 52 44.6	16.185
1	13 15 43.21	2.3153		12 8 54.0	16.126
2	13 18 2.32	2.3218		12 24 59.7	16.064
3	13 20 21.83	2.3284		12 41 1.7	16.001
4	13 22 41.73	2.3350		12 56 59.8	15.935
5	13 25 2.03	2.3417		13 12 53.9	15.867
6	13 27 22.73	2.3483		13 28 43.8	15.796
7	13 29 43.83	2.3552		13 44 29.4	15.723
8	13 32 5.35	2.3621		14 0 10.6	15.648
9	13 34 27.28	2.3689		14 15 47.2	15.571
10	13 36 49.62	2.3758		14 31 19.1	15.491
11	13 39 12.38	2.3829		14 46 46.1	15.409
12	13 41 35.57	2.3900		15 2 8.2	15.326
13	13 43 59.18	2.3971		15 17 25.2	15.239
14	13 46 23.22	2.4043		15 32 36.9	15.150
15	13 48 47.69	2.4114		15 47 43.2	15.058
16	13 51 12.59	2.4187		16 2 43.9	14.964
17	13 53 37.93	2.4260		16 17 38.9	14.868
18	13 56 3.71	2.4333		16 32 28.1	14.771
19	13 58 29.93	2.4407		16 47 11.4	14.670
20	14 0 56.59	2.4480		17 1 48.5	14.567
21	14 3 23.69	2.4553		17 16 19.4	14.462
22	14 5 51.23	2.4628		17 30 43.9	14.354
23	14 8 19.22	2.4703	S.	17 45 1.9	14.244

MONDAY 16.

Hour.	Right Ascension.	Diff. for 1 Min.		Declination.	Diff. for 1 Min.
0	14 10 47.66	2.4778	S.	17 59 13.2	14.132
1	14 13 16.55	2.4852		18 13 17.7	14.017
2	14 15 45.88	2.4926		18 27 15.2	13.900
3	14 18 15.66	2.5001		18 41 5.7	13.781
4	14 20 45.89	2.5076		18 54 48.9	13.657
5	14 23 16.57	2.5151		19 8 24.6	13.533
6	14 25 47.70	2.5226		19 21 52.9	13.407
7	14 28 19.28	2.5301		19 35 13.5	13.278
8	14 30 51.31	2.5376		19 48 26.3	13.147
9	14 33 23.79	2.5450		20 1 31.2	13.013
10	14 35 56.71	2.5523		20 14 27.9	12.877
11	14 38 30.07	2.5598		20 27 16.4	12.739
12	14 41 3.88	2.5672		20 39 56.6	12.599
13	14 43 38.13	2.5745		20 52 28.3	12.457
14	14 46 12.82	2.5818		21 4 51.4	12.311
15	14 48 47.94	2.5890		21 17 5.6	12.163
16	14 51 23.50	2.5963		21 29 11.0	12.014
17	14 53 59.49	2.6034		21 41 7.3	11.862
18	14 56 35.91	2.6105		21 52 54.4	11.707
19	14 59 12.75	2.6175		22 4 32.2	11.552
20	15 1 50.01	2.6245		22 16 0.6	11.394
21	15 4 27.69	2.6314		22 27 19.5	11.233
22	15 7 5.78	2.6383		22 38 28.6	11.071
23	15 9 44.28	2.6451		22 49 28.0	10.907
24	15 12 23.19	2.6518	S.	23 0 17.4	10.739

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 17.					THURSDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 12 23.19	2.6518	S. 23 0 17.4	10.739	0	17 24 44.37	2.7925	S. 27 54 5.5	1.132
1	15 15 2.49	2.6583	23 10 56.7	10.571	1	17 27 31.86	2.7905	27 55 7.0	0.918
2	15 17 42.19	2.6649	23 21 25.9	10.401	2	17 30 19.23	2.7883	27 55 55.7	0.707
3	15 20 22.28	2.6713	23 31 44.8	10.228	3	17 33 6.45	2.7858	27 56 31.8	0.496
4	15 23 2.75	2.6776	23 41 53.3	10.053	4	17 35 53.52	2.7831	27 56 55.2	0.285
5	15 25 43.59	2.6838	23 51 51.2	9.877	5	17 38 40.42	2.7802	27 57 6.0	−0.075
6	15 28 24.80	2.6898	24 1 38.5	9.698	6	17 41 27.14	2.7771	27 57 4.2	+0.135
7	15 31 6.37	2.6958	24 11 15.0	9.518	7	17 44 13.67	2.7738	27 56 49.8	0.344
8	15 33 48.30	2.7017	24 20 40.7	9.337	8	17 46 59.99	2.7702	27 56 22.9	0.552
9	15 36 30.57	2.7073	24 29 55.4	9.152	9	17 49 46.09	2.7664	27 55 43.6	0.759
10	15 39 13.18	2.7130	24 38 59.0	8.967	10	17 52 31.96	2.7625	27 54 51.8	0.966
11	15 41 56.13	2.7185	24 47 51.5	8.781	11	17 55 17.59	2.7583	27 53 47.7	1.171
12	15 44 39.40	2.7238	24 56 32.7	8.592	12	17 58 2.96	2.7539	27 52 31.3	1.376
13	15 47 22.99	2.7290	25 5 2.5	8.401	13	18 0 48.06	2.7493	27 51 2.6	1.579
14	15 50 6.88	2.7340	25 13 20.8	8.209	14	18 3 32.88	2.7447	27 49 21.8	1.781
15	15 52 51.07	2.7388	25 21 27.6	8.016	15	18 6 17.42	2.7398	27 47 28.9	1.982
16	15 55 35.54	2.7436	25 29 22.7	7.821	16	18 9 1.65	2.7345	27 45 23.9	2.182
17	15 58 20.30	2.7482	25 37 6.1	7.624	17	18 11 45.56	2.7292	27 43 7.0	2.381
18	16 1 5.32	2.7525	25 44 37.6	7.427	18	18 14 29.15	2.7238	27 40 38.2	2.579
19	16 3 50.60	2.7568	25 51 57.3	7.228	19	18 17 12.41	2.7182	27 37 57.6	2.774
20	16 6 36.13	2.7608	25 59 5.0	7.027	20	18 19 55.33	2.7123	27 35 5.3	2.969
21	16 9 21.90	2.7648	26 6 0.6	6.826	21	18 22 37.89	2.7063	27 32 1.3	3.163
22	16 12 7.90	2.7684	26 12 44.1	6.623	22	18 25 20.08	2.7001	27 28 45.7	3.356
23	16 14 54.11	2.7719	S. 26 19 15.4	6.420	23	18 28 1.90	2.6938	S. 27 25 18.6	3.546
	WEDNESDAY 18.					FRIDAY 20.			
0	16 17 40.53	2.7753	S. 26 25 34.5	6.215	0	18 30 43.33	2.6873	S. 27 21 40.2	3.734
1	16 20 27.15	2.7785	26 31 41.2	6.009	1	18 33 24.37	2.6806	27 17 50.5	3.922
2	16 23 13.95	2.7813	26 37 35.6	5.802	2	18 36 5.00	2.6738	27 13 49.5	4.109
3	16 26 0.91	2.7841	26 43 17.5	5.594	3	18 38 45.22	2.6668	27 9 37.4	4.293
4	16 28 48.04	2.7867	26 48 46.9	5.387	4	18 41 25.02	2.6598	27 5 14.3	4.476
5	16 31 35.31	2.7890	26 54 3.9	5.177	5	18 44 4.40	2.6527	27 0 40.3	4.657
6	16 34 22.72	2.7912	26 59 8.2	4.967	6	18 46 43.34	2.6453	26 55 55.5	4.837
7	16 37 10.25	2.7931	27 3 59.9	4.757	7	18 49 21.83	2.6378	26 50 59.9	5.015
8	16 39 57.89	2.7948	27 8 39.0	4.546	8	18 51 59.87	2.6303	26 45 53.7	5.191
9	16 42 45.63	2.7963	27 13 5.4	4.334	9	18 54 37.46	2.6226	26 40 37.0	5.365
10	16 45 33.44	2.7975	27 17 19.1	4.122	10	18 57 14.58	2.6148	26 35 9.9	5.537
11	16 48 21.33	2.7987	27 21 20.0	3.909	11	18 59 51.23	2.6068	26 29 32.5	5.708
12	16 51 9.28	2.7995	27 25 8.2	3.696	12	19 2 27.40	2.5988	26 23 44.9	5.877
13	16 53 57.27	2.8002	27 28 43.5	3.482	13	19 5 3.08	2.5907	26 17 47.2	6.044
14	16 56 45.30	2.8006	27 32 6.0	3.268	14	19 7 38.28	2.5825	26 11 39.6	6.209
15	16 59 33.34	2.8008	27 35 15.7	3.055	15	19 10 12.98	2.5742	26 5 22.1	6.373
16	17 2 21.39	2.8008	27 38 12.6	2.841	16	19 12 47.18	2.5658	25 58 54.8	6.535
17	17 5 9.43	2.8005	27 40 56.6	2.627	17	19 15 20.88	2.5574	25 52 17.9	6.694
18	17 7 57.45	2.8000	27 43 27.8	2.412	18	19 17 54.07	2.5488	25 45 31.5	6.852
19	17 10 45.43	2.7993	27 45 46.1	2.198	19	19 20 26.74	2.5403	25 38 35.7	7.008
20	17 13 33.37	2.7985	27 47 51.6	1.985	20	19 22 58.90	2.5317	25 31 30.5	7.162
21	17 16 21.25	2.7973	27 49 44.3	1.771	21	19 25 30.54	2.5229	25 24 16.2	7.314
22	17 19 9.05	2.7959	27 51 24.1	1.557	22	19 28 1.65	2.5141	25 16 52.8	7.465
23	17 21 56.76	2.7943	27 52 51.2	1.345	23	19 30 32.23	2.5053	25 9 20.4	7.613
24	17 24 44.37	2.7925	S. 27 54 5.5	1.132	24	19 33 2.28	2.4963	S. 25 1 39.2	7.759

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 21.					MONDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 33 2.28	2.4963	S. 25 1 39.2	7.759	0	21 22 37.24	2.0830	S. 16 36 36.9	12.602
1	19 35 31.79	2.4874	24 53 49.3	7.903	1	21 24 42.00	2.0758	16 23 58.9	12.662
2	19 38 0.77	2.4785	24 45 50.8	8.046	2	21 26 46.33	2.0685	16 11 17.4	12.722
3	19 40 29.21	2.4695	24 37 43.8	8.187	3	21 28 50.22	2.0613	15 58 32.3	12.779
4	19 42 57.11	2.4604	24 29 28.4	8.325	4	21 30 53.69	2.0543	15 45 43.9	12.835
5	19 45 24.46	2.4514	24 21 4.8	8.461	5	21 32 56.74	2.0473	15 32 52.1	12.890
6	19 47 51.28	2.4424	24 12 33.1	8.596	6	21 34 59.37	2.0403	15 19 57.1	12.943
7	19 50 17.55	2.4333	24 3 53.3	8.729	7	21 37 1.58	2.0335	15 6 58.9	12.996
8	19 52 43.27	2.4241	23 55 5.6	8.860	8	21 39 3.39	2.0268	14 53 57.6	13.046
9	19 55 8.44	2.4150	23 46 10.1	8.989	9	21 41 4.80	2.0202	14 40 53.4	13.095
10	19 57 33.07	2.4059	23 37 6.9	9.116	10	21 43 5.81	2.0136	14 27 46.2	13.144
11	19 59 57.15	2.3968	23 27 56.2	9.240	11	21 45 6.43	2.0071	14 14 36.1	13.192
12	20 2 20.68	2.3876	23 18 38.1	9.363	12	21 47 6.66	2.0007	14 1 23.2	13.237
13	20 4 43.66	2.3785	23 9 12.6	9.484	13	21 49 6.51	1.9943	13 48 7.7	13.281
14	20 7 6.10	2.3694	22 59 40.0	9.603	14	21 51 5.98	1.9882	13 34 49.5	13.325
15	20 9 27.99	2.3603	22 50 0.2	9.721	15	21 53 5.09	1.9821	13 21 28.7	13.367
16	20 11 49.34	2.3513	22 40 13.5	9.836	16	21 55 3.83	1.9759	13 8 5.5	13.407
17	20 14 10.14	2.3422	22 30 19.9	9.950	17	21 57 2.20	1.9699	12 54 39.9	13.447
18	20 16 30.40	2.3331	22 20 19.5	10.062	18	21 59 0.22	1.9641	12 41 11.9	13.486
19	20 18 50.11	2.3241	22 10 12.5	10.171	19	22 0 57.89	1.9583	12 27 41.6	13.522
20	20 21 9.29	2.3152	21 59 59.0	10.279	20	22 2 55.22	1.9527	12 14 9.2	13.558
21	20 23 27.93	2.3062	21 49 39.0	10.385	21	22 4 52.21	1.9470	12 0 34.6	13.594
22	20 25 46.03	2.2972	21 39 12.8	10.489	22	22 6 48.86	1.9414	11 46 57.9	13.628
23	20 28 3.59	2.2883	S. 21 28 40.3	10.592	23	22 8 45.18	1.9360	S. 11 33 19.2	13.661
	SUNDAY 22.					TUESDAY 24.			
0	20 30 20.62	2.2794	S. 21 18 1.7	10.692	0	22 10 41.18	1.9307	S. 11 19 38.6	13.692
1	20 32 37.12	2.2706	21 7 17.2	10.791	1	22 12 36.86	1.9254	11 5 56.1	13.723
2	20 34 53.09	2.2618	20 56 26.8	10.888	2	22 14 32.23	1.9203	10 52 11.8	13.752
3	20 37 8.53	2.2531	20 45 30.6	10.984	3	22 16 27.30	1.9153	10 38 25.8	13.781
4	20 39 23.46	2.2444	20 34 28.7	11.077	4	22 18 22.06	1.9103	10 24 38.1	13.809
5	20 41 37.86	2.2358	20 23 21.3	11.169	5	22 20 16.53	1.9053	10 10 48.7	13.836
6	20 43 51.75	2.2272	20 12 8.4	11.259	6	22 22 10.70	1.9005	9 56 57.8	13.861
7	20 46 5.12	2.2186	20 0 50.2	11.347	7	22 24 4.59	1.8958	9 43 5.4	13.886
8	20 48 17.98	2.2101	19 49 26.7	11.434	8	22 25 58.20	1.8912	9 29 11.5	13.909
9	20 50 30.33	2.2016	19 37 58.1	11.519	9	22 27 51.53	1.8866	9 15 16.3	13.932
10	20 52 42.17	2.1932	19 26 24.4	11.602	10	22 29 44.59	1.8822	9 1 19.7	13.953
11	20 54 53.51	2.1849	19 14 45.8	11.684	11	22 31 37.39	1.8778	8 47 21.9	13.974
12	20 57 4.36	2.1767	19 3 2.3	11.764	12	22 33 29.93	1.8735	8 33 22.8	13.994
13	20 59 14.71	2.1685	18 51 14.1	11.842	13	22 35 22.21	1.8693	8 19 22.6	14.012
14	21 1 24.58	2.1604	18 39 21.2	11.919	14	22 37 14.25	1.8653	8 5 21.3	14.031
15	21 3 33.96	2.1523	18 27 23.8	11.994	15	22 39 6.04	1.8613	7 51 18.9	14.048
16	21 5 42.86	2.1443	18 15 21.9	12.068	16	22 40 57.60	1.8573	7 37 15.5	14.064
17	21 7 51.28	2.1364	18 3 15.6	12.141	17	22 42 48.92	1.8535	7 23 11.2	14.079
18	21 9 59.23	2.1286	17 51 5.0	12.211	18	22 44 40.02	1.8498	7 9 6.0	14.093
19	21 12 6.71	2.1208	17 38 50.3	12.280	19	22 46 30.89	1.8461	6 55 0.0	14.107
20	21 14 13.73	2.1132	17 26 31.4	12.347	20	22 48 21.55	1.8425	6 40 53.2	14.120
21	21 16 20.29	2.1055	17 14 8.6	12.413	21	22 50 11.99	1.8390	6 26 45.6	14.132
22	21 18 26.39	2.0979	17 1 41.8	12.478	22	22 52 2.23	1.8357	6 12 37.4	14.142
23	21 20 32.04	2.0904	16 49 11.2	12.541	23	22 53 52.27	1.8323	5 58 28.5	14.152
24	21 22 37.24	2.0830	S. 16 36 36.9	12.602	24	22 55 42.11	1.8291	S. 5 44 19.1	14.161

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 25.					FRIDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 55 42.11	1.8291	S. 5 44 19.1	14.161	0	0 21 22.76	1.7715	N. 5 31 42.6	13.734
1	22 57 31.76	1.8260	5 30 9.2	14.169	1	0 23 9.07	1.7723	5 45 25.9	13.708
2	22 59 21.23	1.8230	5 15 58.8	14.177	2	0 24 55.43	1.7730	5 59 7.6	13.682
3	23 1 10.52	1.8200	5 1 47.9	14.184	3	0 26 41.83	1.7738	6 12 47.7	13.655
4	23 2 59.63	1.8171	4 47 36.7	14.190	4	0 28 28.29	1.7748	6 26 26.2	13.627
5	23 4 48.57	1.8143	4 33 25.1	14.196	5	0 30 14.80	1.7758	6 40 3.0	13.598
6	23 6 37.35	1.8116	4 19 13.2	14.200	6	0 32 1.38	1.7768	6 53 38.0	13.569
7	23 8 25.96	1.8089	4 5 1.1	14.203	7	0 33 48.02	1.7779	7 7 11.3	13.539
8	23 10 14.42	1.8065	3 50 48.8	14.207	8	0 35 34.73	1.7791	7 20 42.7	13.508
9	23 12 2.74	1.8041	3 36 36.3	14.209	9	0 37 21.51	1.7804	7 34 12.3	13.477
10	23 13 50.91	1.8017	3 22 23.7	14.210	10	0 39 8.38	1.7818	7 47 40.0	13.445
11	23 15 38.94	1.7993	3 8 11.1	14.210	11	0 40 55.32	1.7831	8 1 5.7	13.412
12	23 17 26.83	1.7972	2 53 58.5	14.210	12	0 42 42.35	1.7846	8 14 29.5	13.379
13	23 19 14.60	1.7951	2 39 45.9	14.209	13	0 44 29.47	1.7862	8 27 51.2	13.345
14	23 21 2.24	1.7930	2 25 33.4	14.207	14	0 46 16.69	1.7878	8 41 10.9	13.311
15	23 22 49.76	1.7911	2 11 21.0	14.206	15	0 48 4.00	1.7894	8 54 28.5	13.275
16	23 24 37.17	1.7893	1 57 8.7	14.202	16	0 49 51.42	1.7912	9 7 43.9	13.239
17	23 26 24.47	1.7874	1 42 56.7	14.197	17	0 51 38.95	1.7930	9 20 57.2	13.202
18	23 28 11.66	1.7857	1 28 45.0	14.193	18	0 53 26.58	1.7948	9 34 8.2	13.165
19	23 29 58.75	1.7841	1 14 33.5	14.188	19	0 55 14.33	1.7968	9 47 17.0	13.127
20	23 31 45.75	1.7826	1 0 22.4	14.182	20	0 57 2.19	1.7988	10 0 23.4	13.087
21	23 33 32.66	1.7812	0 46 11.6	14.176	21	0 58 50.18	1.8009	10 13 27.5	13.048
22	23 35 19.49	1.7798	0 32 1.3	14.168	22	1 0 38.30	1.8030	10 26 29.2	13.007
23	23 37 6.24	1.7785	S. 0 17 51.4	14.160	23	1 2 26.54	1.8052	N. 10 39 28.4	12.967
	THURSDAY 26.					SATURDAY 28.			
0	23 38 52.91	1.7773	S. 0 3 42.1	14.151	0	1 4 14.92	1.8075	N. 10 52 25.2	12.925
1	23 40 39.51	1.7762	N. 0 10 26.7	14.142	1	1 6 3.44	1.8098	11 5 19.4	12.882
2	23 42 26.05	1.7752	0 24 34.9	14.132	2	1 7 52.10	1.8122	11 18 11.0	12.838
3	23 44 12.53	1.7741	0 38 42.5	14.121	3	1 9 40.90	1.8146	11 31 0.0	12.794
4	23 45 58.94	1.7732	0 52 49.4	14.108	4	1 11 29.85	1.8172	11 43 46.3	12.750
5	23 47 45.31	1.7724	1 6 55.5	14.097	5	1 13 18.96	1.8198	11 56 30.0	12.705
6	23 49 31.63	1.7717	1 21 1.0	14.084	6	1 15 8.22	1.8223	12 9 10.9	12.658
7	23 51 17.91	1.7711	1 35 5.6	14.070	7	1 16 57.64	1.8250	12 21 48.9	12.610
8	23 53 4.16	1.7705	1 49 9.4	14.056	8	1 18 47.22	1.8278	12 34 24.1	12.562
9	23 54 50.37	1.7699	2 3 12.3	14.041	9	1 20 36.98	1.8307	12 46 56.4	12.514
10	23 56 36.55	1.7695	2 17 14.3	14.025	10	1 22 26.90	1.8334	12 59 25.8	12.465
11	23 58 22.71	1.7692	2 31 15.3	14.008	11	1 24 16.99	1.8364	13 11 52.2	12.415
12	0 0 8.85	1.7689	2 45 15.3	13.991	12	1 26 7.27	1.8394	13 24 15.6	12.364
13	0 1 54.98	1.7688	2 59 14.2	13.973	13	1 27 57.72	1.8424	13 36 35.9	12.312
14	0 3 41.10	1.7686	3 13 12.1	13.956	14	1 29 48.36	1.8456	13 48 53.1	12.260
15	0 5 27.21	1.7685	3 27 8.9	13.937	15	1 31 39.19	1.8488	14 1 7.1	12.207
16	0 7 13.32	1.7686	3 41 4.5	13.917	16	1 33 30.21	1.8519	14 13 17.9	12.152
17	0 8 59.44	1.7687	3 54 58.9	13.897	17	1 35 21.42	1.8552	14 25 25.4	12.097
18	0 10 45.56	1.7688	4 8 52.1	13.875	18	1 37 12.83	1.8585	14 37 29.6	12.042
19	0 12 31.70	1.7692	4 22 43.9	13.853	19	1 39 4.44	1.8619	14 49 30.5	11.986
20	0 14 17.86	1.7695	4 36 34.5	13.832	20	1 40 56.26	1.8653	15 1 27.9	11.928
21	0 16 4.04	1.7699	4 50 23.7	13.808	21	1 42 48.28	1.8688	15 13 21.9	11.871
22	0 17 50.25	1.7704	5 4 11.5	13.784	22	1 44 40.51	1.8723	15 25 12.4	11.812
23	0 19 36.49	1.7709	5 17 57.8	13.759	23	1 46 32.96	1.8759	15 36 59.3	11.752
24	0 21 22.76	1.7715	N. 5 31 42.6	13.734	24	1 48 25.62	1.8795	N. 15 48 42.6	11.692

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
SUNDAY 29.				
	h m s	s	° ′ ″	″
0	1 48 25.62	1.8795	N. 15 48 42.6	11.692
1	1 50 18.50	1.8832	16 0 22.3	11.631
2	1 52 11.60	1.8869	16 11 58.3	11.568
3	1 54 4.93	1.8907	16 23 30.5	11.505
4	1 55 58.48	1.8944	16 34 58.9	11.442
5	1 57 52.26	1.8983	16 46 23.5	11.377
6	1 59 46.28	1.9022	16 57 44.2	11.312
7	2 1 40.53	1.9062	17 9 0.9	11.245
8	2 3 35.02	1.9103	17 20 13.6	11.178
9	2 5 29.76	1.9143	17 31 22.3	11.111
10	2 7 24.73	1.9183	17 42 26.9	11.042
11	2 9 19.95	1.9224	17 53 27.3	10.972
12	2 11 15.42	1.9266	18 4 23.5	10.901
13	2 13 11.14	1.9308	18 15 15.4	10.830
14	2 15 7.11	1.9349	18 26 3.1	10.757
15	2 17 3.33	1.9393	18 36 46.3	10.683
16	2 18 59.82	1.9436	18 47 25.1	10.610
17	2 20 56.56	1.9478	18 57 59.5	10.535
18	2 22 53.56	1.9522	19 8 29.3	10.459
19	2 24 50.82	1.9566	19 18 54.6	10.382
20	2 26 48.35	1.9611	19 29 15.2	10.304
21	2 28 46.15	1.9655	19 39 31.1	10.226
22	2 30 44.21	1.9700	19 49 42.3	10.147
23	2 32 42.55	1.9745	N. 19 59 48.7	10.066
MONDAY 30.				
0	2 34 41.15	1.9790	N. 20 9 50.2	9.984
1	2 36 40.03	1.9836	20 19 46.8	9.902
2	2 38 39.18	1.9882	20 29 38.5	9.820
3	2 40 38.61	1.9928	20 39 25.2	9.735
4	2 42 38.31	1.9973	20 49 6.7	9.650
5	2 44 38.29	2.0020	20 58 43.2	9.565
6	2 46 38.55	2.0067	21 8 14.5	9.478
7	2 48 39.09	2.0113	21 17 40.5	9.390
8	2 50 39.91	2.0161	21 27 1.3	9.302
9	2 52 41.02	2.0208	21 36 16.7	9.212
10	2 54 42.41	2.0255	21 45 26.7	9.121
11	2 56 44.08	2.0303	21 54 31.2	9.029
12	2 58 46.04	2.0350	22 3 30.2	8.937
13	3 0 48.28	2.0398	22 12 23.6	8.844
14	3 2 50.81	2.0446	22 21 11.5	8.751
15	3 4 53.63	2.0493	22 29 53.7	8.655
16	3 6 56.73	2.0541	22 38 30.1	8.558
17	3 9 0.12	2.0588	22 47 0.7	8.462
18	3 11 3.79	2.0636	22 55 25.5	8.364
19	3 13 7.75	2.0683	23 3 44.4	8.266
20	3 15 11.99	2.0731	23 11 57.4	8.166
21	3 17 16.52	2.0778	23 20 4.3	8.065
22	3 19 21.33	2.0826	23 28 5.2	7.964
23	3 21 26.43	2.0874	23 36 0.0	7.861
24	3 23 31.82	2.0922	N. 23 43 48.6	7.757

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
TUESDAY, DECEMBER 1.				
	h m s	s	° ′ ″	″
0	3 23 31.82	2.0922	N. 23 43 48.6	7.757

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Nov.	2	11	48.6
☾	Last Quarter		10	11	36.8
●	New Moon		17	4	1.9
☽	First Quarter		24	1	38.7

			d	h
☾	Apogee	Nov.	2	7.8
☾	Perigee		16	15.9
☾	Apogee		29	10.6

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	16 26 51.59	10.777	S. 21 43 36.1	−23.93	16 15.29	70.20	11 6.47	0.918
Wed.	2	16 31 10.58	10.804	21 52 57.8	22.89	16 15.44	70.29	10 44.11	0.945
Thur.	3	16 35 30.20	10.830	22 1 54.3	21.83	16 15.59	70.37	10 21.11	0.971
Frid.	4	16 39 50.43	10.855	22 10 25.4	−20.76	16 15.73	70.45	9 57.49	0.996
Sat.	5	16 44 11.26	10.880	22 18 30.8	19.69	16 15.87	70.53	9 33.28	1.020
SUN.	6	16 48 32.68	10.904	22 26 10.2	18.61	16 16.00	70.60	9 8.50	1.044
Mon.	7	16 52 54.65	10.927	22 33 23.4	−17.50	16 16.13	70.68	8 43.17	1.067
Tues.	8	16 57 17.14	10.948	22 40 10.2	16.39	16 16.25	70.75	8 17.30	1.088
Wed.	9	17 1 40.14	10.968	22 46 30.4	15.28	16 16.37	70.82	7 50.92	1.108
Thur.	10	17 6 3.62	10.988	22 52 23.7	−14.16	16 16.48	70.88	7 24.07	1.128
Frid.	11	17 10 27.56	11.006	22 57 50.0	13.04	16 16.59	70.93	6 56.76	1.146
Sat.	12	17 14 51.93	11.023	23 2 49.0	11.91	16 16.69	70.98	6 29.04	1.163
SUN.	13	17 19 16.69	11.039	23 7 20.5	−10.76	16 16.79	71.03	6 0.92	1.179
Mon.	14	17 23 41.80	11.053	23 11 24.5	9.59	16 16.89	71.07	5 32.45	1.193
Tues.	15	17 28 7.23	11.066	23 15 0.7	8.43	16 16.98	71.11	5 3.65	1.205
Wed.	16	17 32 32.95	11.077	23 18 9.1	− 7.26	16 17.07	71.14	4 34.57	1.216
Thur.	17	17 36 58.91	11.086	23 20 49.4	6.09	16 17.16	71.17	4 5.25	1.226
Frid.	18	17 41 25.08	11.094	23 23 1.5	4.92	16 17.24	71.20	3 35.72	1.234
Sat.	19	17 45 51.42	11.100	23 24 45.5	− 3.74	16 17.32	71.22	3 6.02	1.240
SUN.	20	17 50 17.89	11.105	23 26 1.3	2.57	16 17.39	71.24	2 36.19	1.244
Mon.	21	17 54 44.44	11.108	23 26 48.8	1.39	16 17.46	71.25	2 6.27	1.248
Tues.	22	17 59 11.05	11.109	23 27 8.0	− 0.21	16 17.52	71.26	1 36.30	1.250
Wed.	23	18 3 37.69	11.109	23 26 58.9	+ 0.97	16 17.58	71.26	1 6.31	1.249
Thur.	24	18 8 4.30	11.108	23 26 21.5	2.15	16 17.64	71.26	0 36.34	1.247
Frid.	25	18 12 30.86	11.105	23 25 15.8	+ 3.32	16 17.69	71.25	0 6.42	1.244
Sat.	26	18 16 57.34	11.101	23 23 42.0	4.50	16 17.74	71.24	0 23.42	1.240
SUN.	27	18 21 23.70	11.095	23 21 39.9	5.67	16 17.78	71.22	0 53.14	1.235
Mon.	28	18 25 49.91	11.088	23 19 9.6	+ 6.84	16 17.82	71.20	1 22.71	1.228
Tues.	29	18 30 15.95	11.080	23 16 11.3	8.01	16 17.85	71.18	1 52.10	1.220
Wed.	30	18 34 41.77	11.071	23 12 45.1	9.17	16 17.87	71.15	2 21.28	1.210
Thur.	31	18 39 7.35	11.060	23 8 51.0	10.33	16 17.89	71.12	2 50.22	1.200
Frid.	32	18 43 32.64	11.047	S. 23 4 29.1	+11.49	16 17.90	71.08	3 18.89	1.189

NOTE.—The mean time of semidiameter passing meridian may be found by subtracting $0^s.19$ from the sidereal time. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	16 26 53.59	10.775	S. 21 43 40.5	−23.91	11 6.30	0.918	16 37 59.89
Wed.	2	16 31 12.51	10.802	21 53 1.8	22.87	10 43.94	0.945	16 41 56.45
Thur.	3	16 35 32.07	10.828	22 1 58.0	21.81	10 20.94	0.971	16 45 53.00
Frid.	4	16 39 52.24	10.853	22 10 28.8	−20.74	9 57.33	0.996	16 49 49.56
Sat.	5	16 44 13.00	10.877	22 18 33.9	19.67	9 33.12	1.020	16 53 46.12
SUN.	6	16 48 34.34	10.901	22 26 13.0	18.59	9 8.34	1.044	16 57 42.68
Mon.	7	16 52 56.23	10.924	22 33 26.0	−17.49	8 43.01	1.067	17 1 39.24
Tues.	8	16 57 18.65	10.945	22 40 12.5	16.38	8 17.15	1.088	17 5 35.80
Wed.	9	17 1 41.58	10.965	22 46 32.4	15.27	7 50.78	1.108	17 9 32.36
Thur.	10	17 6 4.98	10.985	22 52 25.5	−14.15	7 23.93	1.128	17 13 28.92
Frid.	11	17 10 28.84	11.003	22 57 51.6	13.02	6 56.63	1.146	17 17 25.47
Sat.	12	17 14 53.12	11.020	23 2 50.3	11.88	6 28.91	1.163	17 21 22.03
SUN.	13	17 19 17.79	11.035	23 7 21.6	−10.73	6 0.80	1.179	17 25 18.59
Mon.	14	17 23 42.81	11.049	23 11 25.4	9.58	5 32.34	1.193	17 29 15.15
Tues.	15	17 28 8.16	11.062	23 15 1.4	8.42	5 3.55	1.205	17 33 11.71
Wed.	16	17 32 33.79	11.073	23 18 9.6	− 7.26	4 34.48	1.216	17 37 8.27
Thur.	17	17 36 59.66	11.082	23 20 49.8	6.09	4 5.17	1.226	17 41 4.83
Frid.	18	17 41 25.74	11.090	23 23 1.8	4.92	3 35.65	1.234	17 45 1.39
Sat.	19	17 45 51.99	11.096	23 24 45.7	− 3.74	3 5.96	1.240	17 48 57.94
SUN.	20	17 50 18.37	11.101	23 26 1.4	2.57	2 36.14	1.244	17 52 54.50
Mon.	21	17 54 44.83	11.104	23 26 48.9	1.39	2 6.23	1.248	17 56 51.06
Tues.	22	17 59 11.35	11.105	23 27 8.1	− 0.21	1 36.27	1.250	18 0 47.62
Wed.	23	18 3 37.89	11.105	23 26 59.0	+ 0.97	1 6.29	1.249	18 4 44.18
Thur.	24	18 8 4.41	11.104	23 26 21.5	2.15	0 36.33	1.247	18 8 40.74
Frid.	25	18 12 30.88	11.101	23 25 15.8	+ 3.32	0 6.42	1.244	18 12 37.30
Sat.	26	18 16 57.27	11.097	23 23 42.0	4.50	0 23.41	1.240	18 16 33.86
SUN.	27	18 21 23.54	11.091	23 21 40.0	5.67	0 53.12	1.235	18 20 30.42
Mon.	28	18 25 49.66	11.084	23 19 9.8	+ 6.84	1 22.68	1.228	18 24 26.98
Tues.	29	18 30 15.60	11.076	23 16 11.6	8.01	1 52.06	1.220	18 28 23.54
Wed.	30	18 34 41.33	11.067	23 12 45.5	9.17	2 21.23	1.210	18 32 20.10
Thur.	31	18 39 6.82	11.056	23 8 51.5	10.33	2 50.16	1.200	18 36 16.66
Frid.	32	18 43 32.03	11.043	S. 23 4 29.7	+11.49	3 18.82	1.189	18 40 13.21

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″		·	h m s
1	335	248 28 8.9	27 15.6	152.05	+0.49	9.993 8184	−29.1	7 20 47.70
2	336	249 28 58.2	28 4.8	152.09	0.49	9.993 7497	28.1	7 16 51.79
3	337	250 29 48.7	28 55.0	152.13	0.47	9.993 6834	27.1	7 12 55.88
4	338	251 30 40.3	29 46.4	152.18	+0.42	9.993 6195	−26.1	7 8 59.96
5	339	252 31 33.1	30 39.0	152.22	0.34	9.993 5581	25.1	7 5 4.05
6	340	253 32 27.1	31 32.8	152.27	0.25	9.993 4991	24.1	7 1 8.14
7	341	254 33 22.2	32 27.7	152.32	+0.13	9.993 4426	−23.1	6 57 12.23
8	342	255 34 18.5	33 23.9	152.37	+0.01	9.993 3884	22.1	6 53 16.31
9	343	256 35 16.1	34 21.3	152.42	−0.12	9.993 3364	21.2	6 49 20.40
10	344	257 36 14.9	35 19.8	152.47	−0.26	9.993 2866	−20.3	6 45 24.49
11	345	258 37 14.8	36 19.6	152.52	0.37	9.993 2389	19.5	6 41 28.57
12	346	259 38 15.9	37 20.5	152.57	0.46	9.993 1930	18.7	6 37 32.66
13	347	260 39 18.1	38 22.5	152.61	−0.53	9.993 1490	−18.0	6 33 36.75
14	348	261 40 21.3	39 25.5	152.65	0.57	9.993 1066	17.3	6 29 40.84
15	349	262 41 25.4	40 29.4	152.69	0.58	9.993 0658	16.7	6 25 44.92
16	350	263 42 30.4	41 34.2	152.72	−0.56	9.993 0265	−16.1	6 21 49.01
17	351	264 43 36.1	42 39.7	152.75	0.51	9.992 9886	15.5	6 17 53.10
18	352	265 44 42.3	43 45.7	152.77	0.42	9.992 9522	14.9	6 13 57.18
19	353	266 45 49.1	44 52.3	152.78	−0.32	9.992 9173	−14.2	6 10 1.27
20	354	267 46 56.3	45 59.3	152.80	0.19	9.992 8841	13.5	6 6 5.36
21	355	268 48 3.7	47 6.5	152.81	−0.05	9.992 8526	12.7	6 2 9.44
22	356	269 49 11.4	48 14.0	152.82	+0.08	9.992 8229	−11.9	5 58 13.53
23	357	270 50 19.2	49 21.6	152.83	0.19	9.992 7952	11.1	5 54 17.61
24	358	271 51 27.2	50 29.4	152.84	0.31	9.992 7697	10.2	5 50 21.70
25	359	272 52 35.2	51 37.2	152.84	+0.42	9.992 7465	− 9.2	5 46 25.79
26	360	273 53 43.3	52 45.1	152.84	0.49	9.992 7256	8.2	5 42 29.88
27	361	274 54 51.5	53 53.1	152.84	0.55	9.992 7072	7.2	5 38 33.96
28	362	275 55 59.8	55 1.2	152.84	+0.58	9.992 6913	− 6.1	5 34 38.05
29	363	276 57 8.0	56 9.2	152.84	0.58	9.992 6780	5.0	5 30 42.14
30	364	277 58 16.3	57 17.3	152.85	0.56	9.992 6675	3.8	5 26 46.22
31	365	278 59 24.6	58 25.4	152.85	0.50	9.992 6597	2.7	5 22 50.31
32	366	279 60 32.9	59 33.5	152.85	+0.43	9.992 6547	− 1.5	5 18 54.39

Note.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour.
$-9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 46.2	14 47.6	54 6.58	+0.377	54 11.73	+0.480	11 7.3	2.05	13.8
2	14 49.3	14 51.4	54 18.07	0.576	54 25.53	0.666	11 57.7	2.15	14.8
3	14 53.7	14 56.3	54 34.04	0.751	54 43.54	0.833	12 50.2	2.21	15.8
4	14 59.1	15 2.3	54 54.02	+0.915	55 5.50	+0.997	13 43.4	2.21	16.8
5	15 5.7	15 9.3	55 17.96	1.079	55 31.40	1.162	14 35.8	2.15	17.8
6	15 13.3	15 17.5	55 45.85	1.247	56 1.34	1.334	15 26.5	2.07	18.8
7	15 22.0	15 26.8	56 17.87	+1.421	56 35.44	+1.507	16 15.1	1.98	19.8
8	15 31.8	15 37.1	56 54.03	1.589	57 13.55	1.664	17 1.9	1.92	20.8
9	15 42.7	15 48.4	57 33.91	1.728	57 54.95	1.776	17 47.8	1.91	21.8
10	15 54.3	16 0.2	58 16.46	+1.804	58 38.15	+1.805	18 34.0	1.95	22.8
11	16 6.1	16 11.8	58 59.67	1.776	59 20.63	1.710	19 22.0	2.06	23.8
12	16 17.2	16 22.2	59 40.54	1.600	59 58.86	1.447	20 13.2	2.22	24.8
13	16 26.6	16 30.3	60 15.10	+1.250	60 28.69	+1.007	21 8.9	2.43	25.8
14	16 33.2	16 35.0	60 39.11	0.723	60 45.91	+0.405	22 9.6	2.63	26.8
15	16 35.8	16 35.4	60 48.73	+0.061	60 47.32	−0.297	23 14.4	2.75	27.8
16	16 33.8	16 31.1	60 41.59	−0.657	60 31.59	−1.004	ó	. .	28.8
17	16 27.3	16 22.5	60 17.58	1.327	59 59.87	1.616	0 20.4	2.73	0.4
18	16 16.8	16 10.4	59 38.97	1.860	59 15.44	2.053	1 24.2	2.57	1.4
19	16 3.4	15 56.1	58 49.92	−2.191	58 23.06	−2.276	2 23.0	2.33	2.4
20	15 48.6	15 41.0	57 55.49	2.310	57 27.82	2.293	3 16.0	2.10	3.4
21	15 33.6	15 26.5	57 0.63	2.231	56 34.42	2.131	4 3.9	1.91	4.4
22	15 19.7	15 13.5	56 9.62	−1.998	55 46.58	−1.839	4 47.9	1.77	5.4
23	15 7.7	15 2.6	55 25.57	1.658	55 6.84	1.462	5 29.3	1.69	6.4
24	14 58.2	14 54.4	54 50.51	1.257	54 36.70	1.044	6 9.5	1.67	7.4
25	14 51.4	14 49.0	54 25.47	−0.829	54 16.81	−0.616	6 49.8	1.70	8.4
26	14 47.3	14 46.3	54 10.68	0.406	54 7.04	−0.203	7 31.4	1.77	9.4
27	14 46.0	14 46.2	54 5.76	−0.012	54 6.71	+0.168	8 15.2	1.88	10.4
28	14 47.1	14 48.4	54 9.75	+0.336	54 14.73	+0.491	9 1.8	2.01	11.4
29	14 50.3	14 52.5	54 21.47	0.629	54 29.77	0.751	9 51.4	2.12	12.4
30	14 55.1	14 58.1	54 39.43	0.856	54 50.26	0.946	10 43.5	2.21	13.4
31	15 1.3	15 4.8	55 2.08	1.021	55 14.71	1.081	11 37.1	2.24	14.4
32	15 8.4	15 12.1	55 27.96	+1.126	55 41.69	+1.160	12 30.6	2.20	15.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 1.					THURSDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 23 31.82	2.0922	N. 23 43 48.6	7.757	0	5 8 49.44	2.2751	N. 27 40 56.2	1.836
1	3 25 37.49	2.0968	23 51 30.9	7.653	1	5 11 6.01	2.2773	27 42 42.2	1.697
2	3 27 43.44	2.1016	23 59 6.9	7.547	2	5 13 22.72	2.2795	27 44 19.9	1.557
3	3 29 49.68	2.1063	24 6 36.6	7.442	3	5 15 39.55	2.2815	27 45 49.1	1.417
4	3 31 56.20	2.1109	24 13 59.9	7.335	4	5 17 56.50	2.2835	27 47 9.9	1.277
5	3 34 2.99	2.1156	24 21 16.8	7.227	5	5 20 13.57	2.2854	27 48 22.3	1.136
6	3 36 10.07	2.1203	24 28 27.1	7.117	6	5 22 30.75	2.2872	27 49 26.2	0.995
7	3 38 17.42	2.1248	24 35 30.9	7.008	7	5 24 48.03	2.2888	27 50 21.7	0.853
8	3 40 25.05	2.1295	24 42 28.1	6.898	8	5 27 5.41	2.2904	27 51 8.6	0.712
9	3 42 32.96	2.1341	24 49 18.7	6.787	9	5 29 22.88	2.2919	27 51 47.1	0.570
10	3 44 41.14	2.1386	24 56 2.5	6.674	10	5 31 40.44	2.2933	27 52 17.0	0.427
11	3 46 49.59	2.1432	25 2 39.6	6.561	11	5 33 58.08	2.2946	27 52 38.3	0.284
12	3 48 58.32	2.1478	25 9 9.8	6.447	12	5 36 15.79	2.2958	27 52 51.1	+0.142
13	3 51 7.32	2.1522	25 15 33.2	6.332	13	5 38 33.57	2.2969	27 52 55.3	−0.002
14	3 53 16.58	2.1566	25 21 49.6	6.216	14	5 40 51.42	2.2980	27 52 50.9	0.145
15	3 55 26.11	2.1610	25 27 59.1	6.099	15	5 43 9.33	2.2989	27 52 37.9	0.288
16	3 57 35.90	2.1653	25 34 1.5	5.982	16	5 45 27.29	2.2998	27 52 16.3	0.432
17	3 59 45.94	2.1696	25 39 56.9	5.863	17	5 47 45.30	2.3005	27 51 46.1	0.576
18	4 1 56.25	2.1739	25 45 45.1	5.744	18	5 50 3.35	2.3012	27 51 7.2	0.720
19	4 4 6.81	2.1782	25 51 26.2	5.624	19	5 52 21.44	2.3018	27 50 19.7	0.863
20	4 6 17.63	2.1824	25 57 0.0	5.503	20	5 54 39.56	2.3022	27 49 23.6	1.007
21	4 8 28.70	2.1865	26 2 26.6	5.382	21	5 56 57.70	2.3025	27 48 18.8	1.152
22	4 10 40.01	2.1906	26 7 45.8	5.259	22	5 59 15.86	2.3028	27 47 5.4	1.296
23	4 12 51.57	2.1947	N. 26 12 57.7	5.137	23	6 1 34.04	2.3030	N. 27 45 43.3	1.441
	WEDNESDAY 2.					FRIDAY 4.			
0	4 15 3.37	2.1987	N. 26 18 2.2	5.012	0	6 3 52.22	2.3031	N. 27 44 12.5	1.585
1	4 17 15.41	2.2026	26 22 59.2	4.887	1	6 6 10.41	2.3031	27 42 33.1	1.728
2	4 19 27.68	2.2065	26 27 48.7	4.762	2	6 8 28.59	2.3029	27 40 45.1	1.872
3	4 21 40.19	2.2103	26 32 30.7	4.637	3	6 10 46.76	2.3027	27 38 48.4	2.017
4	4 23 52.92	2.2141	26 37 5.1	4.509	4	6 13 4.92	2.3024	27 36 43.0	2.162
5	4 26 5.88	2.2178	26 41 31.8	4.382	5	6 15 23.05	2.3020	27 34 29.0	2.305
6	4 28 19.06	2.2215	26 45 50.9	4.253	6	6 17 41.16	2.3016	27 32 6.4	2.449
7	4 30 32.46	2.2251	26 50 2.2	4.124	7	6 19 59.24	2.3011	27 29 35.1	2.593
8	4 32 46.07	2.2285	26 54 5.8	3.994	8	6 22 17.29	2.3004	27 26 55.2	2.736
9	4 34 59.89	2.2319	26 58 1.6	3.864	9	6 24 35.29	2.2996	27 24 6.8	2.879
10	4 37 13.91	2.2354	27 1 49.5	3.733	10	6 26 53.24	2.2988	27 21 9.7	3.023
11	4 39 28.14	2.2388	27 5 29.5	3.601	11	6 29 11.15	2.2979	27 18 4.0	3.167
12	4 41 42.56	2.2420	27 9 1.6	3.468	12	6 31 28.99	2.2968	27 14 49.7	3.309
13	4 43 57.18	2.2453	27 12 25.7	3.336	13	6 33 46.77	2.2958	27 11 26.9	3.452
14	4 46 11.99	2.2483	27 15 41.9	3.202	14	6 36 4.48	2.2946	27 7 55.5	3.594
15	4 48 26.98	2.2513	27 18 50.0	3.068	15	6 38 22.12	2.2933	27 4 15.6	3.737
16	4 50 42.15	2.2543	27 21 50.1	2.934	16	6 40 39.68	2.2920	27 0 27.1	3.878
17	4 52 57.50	2.2572	27 24 42.1	2.798	17	6 42 57.16	2.2906	26 56 30.2	4.019
18	4 55 13.01	2.2600	27 27 25.9	2.662	18	6 45 14.55	2.2890	26 52 24.8	4.161
19	4 57 28.70	2.2628	27 30 1.5	2.526	19	6 47 31.84	2.2874	26 48 10.9	4.302
20	4 59 44.54	2.2653	27 32 29.0	2.389	20	6 49 49.04	2.2858	26 43 48.6	4.442
21	5 2 0.54	2.2680	27 34 48.2	2.252	21	6 52 6.14	2.2841	26 39 17.9	4.582
22	5 4 16.70	2.2705	27 36 59.2	2.114	22	6 54 23.13	2.2823	26 34 38.8	4.722
23	5 6 33.00	2.2728	27 39 1.9	1.975	23	6 56 40.01	2.2803	26 29 51.2	4.862
24	5 8 49.44	2.2751	N. 27 40 56.2	1.836	24	6 58 56.77	2.2784	N. 26 24 55.4	4.999

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 5.					MONDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 58 56.77	2.2784	N. 26 24 55.4	4.999	0	8 45 6.33	2.1343	N. 19 56 17.7	10.913
1	7 1 13.42	2.2764	26 19 51.3	5.138	1	8 47 14.29	2.1311	19 45 19.8	11.017
2	7 3 29.94	2.2743	26 14 38.8	5.277	2	8 49 22.06	2.1278	19 34 15.7	11.120
3	7 5 46.33	2.2721	26 9 18.1	5.413	3	8 51 29.63	2.1246	19 23 5.4	11.222
4	7 8 2.59	2.2699	26 3 49.2	5.551	4	8 53 37.01	2.1213	19 11 49.1	11.322
5	7 10 18.72	2.2676	25 58 12.0	5.687	5	8 55 44.19	2.1181	19 0 26.8	11.422
6	7 12 34.70	2.2653	25 52 26.7	5.823	6	8 57 51.18	2.1149	18 48 58.5	11.522
7	7 14 50.55	2.2629	25 46 33.2	5.959	7	8 59 57.98	2.1118	18 37 24.2	11.620
8	7 17 6.25	2.2604	25 40 31.6	6.093	8	9 2 4.59	2.1087	18 25 44.1	11.717
9	7 19 21.80	2.2578	25 34 22.0	6.227	9	9 4 11.02	2.1056	18 13 58.2	11.813
10	7 21 37.19	2.2553	25 28 4.3	6.362	10	9 6 17.26	2.1025	18 2 6.5	11.909
11	7 23 52.43	2.2527	25 21 38.6	6.494	11	9 8 23.32	2.0994	17 50 9.1	12.003
12	7 26 7.51	2.2499	25 15 5.0	6.627	12	9 10 29.19	2.0963	17 38 6.1	12.097
13	7 28 22.42	2.2472	25 8 23.4	6.759	13	9 12 34.88	2.0934	17 25 57.5	12.189
14	7 30 37.17	2.2444	25 1 33.9	6.891	14	9 14 40.40	2.0906	17 13 43.4	12.281
15	7 32 51.75	2.2416	24 54 36.5	7.021	15	9 16 45.75	2.0876	17 1 23.8	12.372
16	7 35 6.16	2.2387	24 47 31.4	7.151	16	9 18 50.91	2.0847	16 48 58.8	12.462
17	7 37 20.39	2.2358	24 40 18.4	7.281	17	9 20 55.91	2.0819	16 36 28.4	12.551
18	7 39 34.45	2.2328	24 32 57.7	7.409	18	9 23 0.74	2.0792	16 23 52.7	12.638
19	7 41 48.33	2.2298	24 25 29.3	7.537	19	9 25 5.41	2.0764	16 11 11.8	12.725
20	7 44 2.03	2.2268	24 17 53.2	7.665	20	9 27 9.91	2.0738	15 58 25.7	12.812
21	7 46 15.54	2.2237	24 10 9.5	7.792	21	9 29 14.26	2.0711	15 45 34.4	12.897
22	7 48 28.87	2.2206	24 2 18.2	7.917	22	9 31 18.44	2.0684	15 32 38.1	12.981
23	7 50 42.01	2.2175	N. 23 54 19.4	8.042	23	9 33 22.47	2.0659	N. 15 19 36.7	13.064
	SUNDAY 6.					TUESDAY 8.			
0	7 52 54.97	2.2143	N. 23 46 13.1	8.167	0	9 35 26.35	2.0634	N. 15 6 30.4	13.146
1	7 55 7.73	2.2111	23 37 59.3	8.291	1	9 37 30.08	2.0610	14 53 19.2	13.227
2	7 57 20.30	2.2078	23 29 38.2	8.413	2	9 39 33.67	2.0586	14 40 3.2	13.307
3	7 59 32.67	2.2046	23 21 9.7	8.536	3	9 41 37.11	2.0562	14 26 42.3	13.387
4	8 1 44.85	2.2013	23 12 33.9	8.657	4	9 43 40.41	2.0539	14 13 16.8	13.465
5	8 3 56.83	2.1980	23 3 50.8	8.778	5	9 45 43.58	2.0518	13 59 46.5	13.542
6	8 6 8.61	2.1948	22 55 0.5	8.897	6	9 47 46.62	2.0496	13 46 11.7	13.618
7	8 8 20.20	2.1914	22 46 3.1	9.017	7	9 49 49.53	2.0473	13 32 32.3	13.694
8	8 10 31.58	2.1881	22 36 58.5	9.135	8	9 51 52.30	2.0452	13 18 48.4	13.769
9	8 12 42.77	2.1848	22 27 46.9	9.252	9	9 53 54.96	2.0433	13 5 0.0	13.842
10	8 14 53.75	2.1814	22 18 28.2	9.369	10	9 55 57.50	2.0414	12 51 7.3	13.914
11	8 17 4.54	2.1781	22 9 2.6	9.485	11	9 57 59.93	2.0395	12 37 10.3	13.986
12	8 19 15.12	2.1747	21 59 30.0	9.600	12	10 0 2.24	2.0377	12 23 9.0	14.057
13	8 21 25.50	2.1713	21 49 50.6	9.714	13	10 2 4.45	2.0359	12 9 3.5	14.126
14	8 23 35.67	2.1679	21 40 4.3	9.827	14	10 4 6.55	2.0342	11 54 53.9	14.194
15	8 25 45.65	2.1646	21 30 11.3	9.940	15	10 6 8.55	2.0326	11 40 40.2	14.262
16	8 27 55.42	2.1612	21 20 11.5	10.052	16	10 8 10.46	2.0310	11 26 22.5	14.328
17	8 30 4.99	2.1578	21 10 5.1	10.162	17	10 10 12.27	2.0295	11 12 0.8	14.394
18	8 32 14.36	2.1544	20 59 52.0	10.272	18	10 12 14.00	2.0281	10 57 35.2	14.458
19	8 34 23.52	2.1510	20 49 32.4	10.381	19	10 14 15.64	2.0267	10 43 5.8	14.522
20	8 36 32.48	2.1477	20 39 6.3	10.489	20	10 16 17.20	2.0254	10 28 32.6	14.584
21	8 38 41.24	2.1443	20 28 33.7	10.597	21	10 18 18.69	2.0243	10 13 55.7	14.646
22	8 40 49.80	2.1411	20 17 54.7	10.702	22	10 20 20.11	2.0231	9 59 15.1	14.707
23	8 42 58.17	2.1377	20 7 9.4	10.808	23	10 22 21.46	2.0220	9 44 30.9	14.766
24	8 45 6.33	2.1343	N. 19 56 17.7	10.913	24	10 24 22.75	2.0210	N. 9 29 43.2	14.824

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 9.					FRIDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 24 22.75	2.0210	N. 9 29 43.2	14.824	0	12 1 46.65	2.0711	S. 3 8 31.6	16.320
1	10 26 23.98	2.0201	9 14 52.0	14.882	1	12 3 51.01	2.0743	3 24 50.8	16.321
2	10 28 25.16	2.0193	8 59 57.4	14.937	2	12 5 55.57	2.0778	3 41 10.1	16.321
3	10 30 26.29	2.0184	8 44 59.5	14.992	3	12 8 0.34	2.0813	3 57 29.3	16.318
4	10 32 27.37	2.0177	8 29 58.3	15.047	4	12 10 5.32	2.0848	4 13 48.3	16.314
5	10 34 28.41	2.0171	8 14 53.8	15.101	5	12 12 10.52	2.0884	4 30 7.0	16.309
6	10 36 29.42	2.0166	7 59 46.2	15.152	6	12 14 15.93	2.0922	4 46 25.4	16.303
7	10 38 30.40	2.0161	7 44 35.5	15.204	7	12 16 21.58	2.0961	5 2 43.4	16.296
8	10 40 31.35	2.0157	7 29 21.7	15.255	8	12 18 27.46	2.1000	5 19 0.9	16.287
9	10 42 32.28	2.0154	7 14 4.9	15.304	9	12 20 33.58	2.1040	5 35 17.8	16.276
10	10 44 33.20	2.0152	6 58 45.2	15.352	10	12 22 39.94	2.1082	5 51 34.0	16.263
11	10 46 34.10	2.0150	6 43 22.7	15.398	11	12 24 46.56	2.1124	6 7 49.4	16.249
12	10 48 35.00	2.0150	6 27 57.4	15.444	12	12 26 53.43	2.1168	6 24 3.9	16.233
13	10 50 35.90	2.0150	6 12 29.4	15.489	13	12 29 0.57	2.1212	6 40 17.4	16.216
14	10 52 36.80	2.0150	5 56 58.7	15.532	14	12 31 7.97	2.1257	6 56 29.8	16.197
15	10 54 37.70	2.0152	5 41 25.5	15.575	15	12 33 15.65	2.1303	7 12 41.1	16.178
16	10 56 38.62	2.0155	5 25 49.7	15.617	16	12 35 23.61	2.1351	7 28 51.2	16.157
17	10 58 39.56	2.0158	5 10 11.5	15.657	17	12 37 31.86	2.1399	7 44 59.9	16.132
18	11 0 40.52	2.0163	4 54 30.9	15.697	18	12 39 40.40	2.1448	8 1 7.1	16.107
19	11 2 41.51	2.0168	4 38 47.9	15.734	19	12 41 49.23	2.1498	8 17 12.8	16.081
20	11 4 42.54	2.0174	4 23 2.8	15.771	20	12 43 58.37	2.1548	8 33 16.8	16.052
21	11 6 43.60	2.0181	4 7 15.4	15.807	21	12 46 7.81	2.1600	8 49 19.1	16.022
22	11 8 44.71	2.0188	3 51 25.9	15.842	22	12 48 17.57	2.1653	9 5 19.5	15.991
23	11 10 45.86	2.0197	N. 3 35 34.3	15.876	23	12 50 27.65	2.1707	S. 9 21 18.0	15.957
	THURSDAY 10.					SATURDAY 12.			
0	11 12 47.07	2.0207	N. 3 19 40.8	15.908	0	12 52 38.05	2.1761	S. 9 37 14.4	15.922
1	11 14 48.34	2.0217	3 3 45.4	15.939	1	12 54 48.78	2.1817	9 53 8.6	15.885
2	11 16 49.67	2.0228	2 47 48.1	15.970	2	12 56 59.85	2.1873	10 9 0.6	15.847
3	11 18 51.08	2.0241	2 31 49.0	15.999	3	12 59 11.26	2.1930	10 24 50.2	15.806
4	11 20 52.56	2.0253	2 15 48.2	16.027	4	13 1 23.01	2.1988	10 40 37.3	15.764
5	11 22 54.12	2.0267	1 59 45.8	16.053	5	13 3 35.12	2.2048	10 56 21.9	15.720
6	11 24 55.77	2.0283	1 43 41.8	16.079	6	13 5 47.58	2.2107	11 12 3.7	15.673
7	11 26 57.51	2.0298	1 27 36.3	16.102	7	13 8 0.40	2.2168	11 27 42.7	15.626
8	11 28 59.35	2.0315	1 11 29.5	16.125	8	13 10 13.60	2.2230	11 43 18.8	15.577
9	11 31 1.29	2.0333	0 55 21.3	16.147	9	13 12 27.16	2.2292	11 58 51.9	15.526
10	11 33 3.34	2.0352	0 39 11.8	16.168	10	13 14 41.10	2.2355	12 14 21.9	15.472
11	11 35 5.51	2.0372	0 23 1.1	16.187	11	13 16 55.42	2.2419	12 29 48.6	15.417
12	11 37 7.80	2.0392	N. 0 6 49.3	16.206	12	13 19 10.13	2.2484	12 45 11.9	15.359
13	11 39 10.21	2.0413	S. 0 9 23.6	16.222	13	13 21 25.23	2.2549	13 0 31.7	15.301
14	11 41 12.75	2.0435	0 25 37.4	16.237	14	13 23 40.72	2.2616	13 15 48.0	15.241
15	11 43 15.43	2.0458	0 41 52.1	16.252	15	13 25 56.62	2.2683	13 31 0.6	15.177
16	11 45 18.25	2.0483	0 58 7.6	16.264	16	13 28 12.92	2.2751	13 46 9.3	15.112
17	11 47 21.23	2.0508	1 14 23.8	16.276	17	13 30 29.63	2.2819	14 1 14.0	15.045
18	11 49 24.35	2.0533	1 30 40.7	16.287	18	13 32 46.75	2.2888	14 16 14.7	14.977
19	11 51 27.63	2.0561	1 46 58.2	16.296	19	13 35 4.29	2.2958	14 31 11.2	14.906
20	11 53 31.08	2.0589	2 3 16.2	16.303	20	13 37 22.25	2.3029	14 46 3.4	14.833
21	11 55 34.70	2.0618	2 19 34.6	16.310	21	13 39 40.64	2.3101	15 0 51.2	14.758
22	11 57 38.50	2.0648	2 35 53.4	16.315	22	13 41 59.46	2.3173	15 15 34.4	14.681
23	11 59 42.48	2.0679	2 52 12.4	16.318	23	13 44 18.72	2.3246	15 30 12.9	14.608
24	12 1 46.65	2.0711	S. 3 8 31.6	16.320	24	13 46 38.41	2.3318	S. 15 44 46.6	14.521

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 13.			
	h m s	s	° ′ ″	″
0	13 46 38.41	2.3318	S. 15 44 46.6	14.521
1	13 48 58.54	2.3392	15 59 15.4	14.438
2	13 51 19.11	2.3466	16 13 39.2	14.352
3	13 53 40.13	2.3542	16 27 57.7	14.265
4	13 56 1.61	2.3618	16 42 11.0	14.176
5	13 58 23.54	2.3693	16 56 18.8	14.084
6	14 0 45.92	2.3768	17 10 21.1	13.991
7	14 3 8.76	2.3846	17 24 17.7	13.895
8	14 5 32.07	2.3923	17 38 8.5	13.797
9	14 7 55.84	2.4001	17 51 53.3	13.696
10	14 10 20.08	2.4078	18 5 32.0	13.594
11	14 12 44.78	2.4156	18 19 4.6	13.490
12	14 15 9.95	2.4234	18 32 30.8	13.382
13	14 17 35.59	2.4313	18 45 50.5	13.274
14	14 20 1.71	2.4393	18 59 3.7	13.163
15	14 22 28.31	2.4473	19 12 10.1	13.049
16	14 24 55.38	2.4552	19 25 9.6	12.934
17	14 27 22.93	2.4631	19 38 2.2	12.817
18	14 29 50.95	2.4710	19 50 47.6	12.697
19	14 32 19.45	2.4790	20 3 25.8	12.575
20	14 34 48.43	2.4870	20 15 56.6	12.451
21	14 37 17.89	2.4949	20 28 19.9	12.324
22	14 39 47.82	2.5028	20 40 35.5	12.195
23	14 42 18.23	2.5108	S. 20 52 43.3	12.064
	MONDAY 14.			
0	14 44 49.12	2.5188	S. 21 4 43.2	11.932
1	14 47 20.48	2.5267	21 16 35.1	11.797
2	14 49 52.32	2.5346	21 28 18.8	11.659
3	14 52 24.63	2.5425	21 39 54.2	11.520
4	14 54 57.42	2.5503	21 51 21.2	11.378
5	14 57 30.67	2.5581	22 2 39.6	11.234
6	15 0 4.39	2.5658	22 13 49.3	11.088
7	15 2 38.57	2.5736	22 24 50.2	10.941
8	15 5 13.22	2.5813	22 35 42.2	10.791
9	15 7 48.32	2.5888	22 46 25.1	10.637
10	15 10 23.88	2.5964	22 56 58.7	10.482
11	15 12 59.89	2.6039	23 7 23.0	10.327
12	15 15 36.35	2.6113	23 17 37.9	10.168
13	15 18 13.25	2.6188	23 27 43.2	10.007
14	15 20 50.60	2.6261	23 37 38.8	9.845
15	15 23 28.38	2.6333	23 47 24.6	9.680
16	15 26 6.59	2.6404	23 57 0.4	9.513
17	15 28 45.23	2.6475	24 6 26.2	9.345
18	15 31 24.29	2.6543	24 15 41.8	9.174
19	15 34 3.75	2.6612	24 24 47.1	9.002
20	15 36 43.63	2.6679	24 33 42.1	8.828
21	15 39 23.90	2.6745	24 42 26.5	8.652
22	15 42 4.57	2.6811	24 51 0.3	8.474
23	15 44 45.63	2.6875	24 59 23.4	8.295
24	15 47 27.07	2.6938	S. 25 7 35.7	8.113

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 15.			
	h m s	s	° ′ ″	″
0	15 47 27.07	2.6938	S. 25 7 35.7	8.113
1	15 50 8.88	2.6998	25 15 37.0	7.930
2	15 52 51.05	2.7058	25 23 27.3	7.745
3	15 55 33.58	2.7118	25 31 6.4	7.558
4	15 58 16.46	2.7175	25 38 34.3	7.371
5	16 0 59.68	2.7230	25 45 50.9	7.182
6	16 3 43.22	2.7283	25 52 56.1	6.990
7	16 6 27.08	2.7337	25 59 49.7	6.797
8	16 9 11.26	2.7388	26 6 31.7	6.603
9	16 11 55.73	2.7437	26 13 2.1	6.408
10	16 14 40.50	2.7484	26 19 20.7	6.211
11	16 17 25.54	2.7530	26 25 27.4	6.012
12	16 20 10.86	2.7575	26 31 22.2	5.813
13	16 22 56.44	2.7618	26 37 5.0	5.612
14	16 25 42.27	2.7658	26 42 35.7	5.411
15	16 28 28.33	2.7695	26 47 54.3	5.207
16	16 31 14.61	2.7732	26 53 0.6	5.003
17	16 34 1.11	2.7767	26 57 54.7	4.799
18	16 36 47.81	2.7799	27 2 36.5	4.593
19	16 39 34.70	2.7829	27 7 5.9	4.387
20	16 42 21.76	2.7858	27 11 22.9	4.179
21	16 45 8.99	2.7884	27 15 27.4	3.971
22	16 47 56.37	2.7908	27 19 19.4	3.762
23	16 50 43.89	2.7930	S. 27 22 58.8	3.552
	WEDNESDAY 16.			
0	16 53 31.53	2.7950	S. 27 26 25.6	3.341
1	16 56 19.29	2.7968	27 29 39.7	3.130
2	16 59 7.15	2.7984	27 32 41.2	2.919
3	17 1 55.10	2.7998	27 35 30.0	2.707
4	17 4 43.12	2.8008	27 38 6.1	2.495
5	17 7 31.20	2.8017	27 40 29.4	2.282
6	17 10 19.32	2.8023	27 42 40.0	2.070
7	17 13 7.47	2.8027	27 44 37.8	1.857
8	17 15 55.64	2.8029	27 46 22.8	1.644
9	17 18 43.82	2.8028	27 47 55.1	1.431
10	17 21 31.98	2.8025	27 49 14.5	1.217
11	17 24 20.12	2.8021	27 50 21.1	1.004
12	17 27 8.23	2.8013	27 51 15.0	0.791
13	17 29 56.28	2.8003	27 51 56.0	0.577
14	17 32 44.27	2.7992	27 52 24.3	0.365
15	17 35 32.18	2.7978	27 52 39.8	−0.152
16	17 38 20.00	2.7961	27 52 42.6	+0.059
17	17 41 7.71	2.7942	27 52 32.7	0.271
18	17 43 55.30	2.7921	27 52 10.1	0.482
19	17 46 42.76	2.7897	27 51 34.8	0.693
20	17 49 30.06	2.7871	27 50 46.9	0.902
21	17 52 17.21	2.7843	27 49 46.5	1.112
22	17 55 4.18	2.7813	27 48 33.5	1.322
23	17 57 50.97	2.7782	27 47 7.9	1.530
24	18 0 37.56	2.7747	S. 27 45 29.9	1.737

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 17.					SATURDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 0 37.56	2.7747	S. 27 45 29.9	1.737	0	20 6 36.22	2.4296	S. 22 49 12.4	9.938
1	18 3 23.93	2.7710	27 43 39.5	1.943	1	20 9 1.72	2.4204	22 39 12.4	10.062
2	18 6 10.08	2.7672	27 41 36.7	2.149	2	20 11 26.67	2.4113	22 29 4.9	10.185
3	18 8 55.99	2.7631	27 39 21.6	2.353	3	20 13 51.08	2.4023	22 18 50.2	10.306
4	18 11 41.65	2.7588	27 36 54.3	2.557	4	20 16 14.94	2.3932	22 8 28.2	10.424
5	18 14 27.04	2.7543	27 34 14.8	2.759	5	20 18 38.26	2.3841	21 57 59.3	10.540
6	18 17 12.16	2.7496	27 31 23.2	2.960	6	20 21 1.03	2.3749	21 47 23.4	10.654
7	18 19 56.99	2.7448	27 28 19.6	3.160	7	20 23 23.25	2.3658	21 36 40.8	10.766
8	18 22 41.53	2.7398	27 25 4.0	3.359	8	20 25 44.93	2.3568	21 25 51.5	10.877
9	18 25 25.76	2.7344	27 21 36.5	3.557	9	20 28 6.06	2.3477	21 14 55.6	10.985
10	18 28 9.66	2.7290	27 17 57.1	3.754	10	20 30 26.65	2.3387	21 3 53.3	11.091
11	18 30 53.24	2.7234	27 14 6.0	3.948	11	20 32 46.70	2.3297	20 52 44.7	11.195
12	18 33 36.47	2.7175	27 10 3.3	4.142	12	20 35 6.21	2.3207	20 41 29.9	11.297
13	18 36 19.34	2.7115	27 5 49.0	4.334	13	20 37 25.18	2.3117	20 30 9.0	11.397
14	18 39 1.85	2.7054	27 1 23.2	4.525	14	20 39 43.61	2.3028	20 18 42.2	11.495
15	18 41 43.99	2.6992	26 56 46.0	4.714	15	20 42 1.51	2.2939	20 7 9.6	11.592
16	18 44 25.75	2.6927	26 51 57.5	4.902	16	20 44 18.88	2.2851	19 55 31.2	11.687
17	18 47 7.11	2.6860	26 46 57.8	5.087	17	20 46 35.72	2.2763	19 43 47.2	11.779
18	18 49 48.07	2.6793	26 41 47.0	5.272	18	20 48 52.03	2.2675	19 31 57.7	11.870
19	18 52 28.62	2.6723	26 36 25.1	5.455	19	20 51 7.82	2.2588	19 20 2.8	11.958
20	18 55 8.75	2.6653	26 30 52.4	5.636	20	20 53 23.09	2.2502	19 8 2.7	12.045
21	18 57 48.46	2.6582	26 25 8.8	5.816	21	20 55 37.84	2.2415	18 55 57.4	12.131
22	19 0 27.73	2.6508	26 19 14.5	5.993	22	20 57 52.07	2.2330	18 43 47.0	12.214
23	19 3 6.55	2.6433	S. 26 13 9.6	6.170	23	21 0 5.80	2.2245	S. 18 31 31.7	12.295
	FRIDAY 18.					SUNDAY 20.			
0	19 5 44.93	2.6358	S. 26 6 54.1	6.344	0	21 2 19.01	2.2160	S. 18 19 11.6	12.374
1	19 8 22.85	2.6281	26 0 28.3	6.516	1	21 4 31.72	2.2076	18 6 46.8	12.452
2	19 11 0.30	2.6203	25 53 52.2	6.687	2	21 6 43.92	2.1993	17 54 17.3	12.529
3	19 13 37.28	2.6123	25 47 5.9	6.855	3	21 8 55.63	2.1911	17 41 43.3	12.603
4	19 16 13.78	2.6043	25 40 9.6	7.022	4	21 11 6.85	2.1828	17 29 4.9	12.676
5	19 18 49.80	2.5963	25 33 3.3	7.187	5	21 13 17.57	2.1747	17 16 22.2	12.747
6	19 21 25.33	2.5880	25 25 47.2	7.349	6	21 15 27.81	2.1667	17 3 35.3	12.816
7	19 24 0.36	2.5797	25 18 21.4	7.510	7	21 17 37.57	2.1587	16 50 44.3	12.882
8	19 26 34.89	2.5713	25 10 46.0	7.669	8	21 19 46.85	2.1508	16 37 49.4	12.948
9	19 29 8.92	2.5629	25 3 1.1	7.827	9	21 21 55.66	2.1429	16 24 50.5	13.013
10	19 31 42.44	2.5543	24 55 6.8	7.982	10	21 24 4.00	2.1351	16 11 47.8	13.076
11	19 34 15.44	2.5458	24 47 3.3	8.134	11	21 26 11.87	2.1274	15 58 41.4	13.137
12	19 36 47.93	2.5371	24 38 50.7	8.285	12	21 28 19.29	2.1198	15 45 31.4	13.196
13	19 39 19.89	2.5283	24 30 29.1	8.434	13	21 30 26.25	2.1123	15 32 17.9	13.253
14	19 41 51.33	2.5196	24 21 58.6	8.582	14	21 32 32.76	2.1048	15 19 1.0	13.309
15	19 44 22.24	2.5107	24 13 19.3	8.726	15	21 34 38.82	2.0973	15 5 40.8	13.364
16	19 46 52.61	2.5018	24 4 31.5	8.868	16	21 36 44.44	2.0901	14 52 17.3	13.417
17	19 49 22.45	2.4929	23 55 35.1	9.010	17	21 38 49.63	2.0828	14 38 50.7	13.469
18	19 51 51.76	2.4840	23 46 30.3	9.148	18	21 40 54.38	2.0756	14 25 21.0	13.519
19	19 54 20.53	2.4750	23 37 17.3	9.285	19	21 42 58.70	2.0686	14 11 48.4	13.567
20	19 56 48.76	2.4659	23 27 56.1	9.420	20	21 45 2.61	2.0617	13 58 13.0	13.614
21	19 59 16.44	2.4568	23 18 26.9	9.552	21	21 47 6.10	2.0547	13 44 34.7	13.661
22	20 1 43.58	2.4478	23 8 49.8	9.683	22	21 49 9.17	2.0478	13 30 53.7	13.705
23	20 4 10.17	2.4387	22 59 4.9	9.812	23	21 51 11.84	2.0412	13 17 10.1	13.747
24	20 6 36.22	2.4296	S. 22 49 12.4	9.938	24	21 53 14.11	2.0345	S. 13 3 24.0	13.789

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 21.			
	h m s	s	° ′ ″	″
0	21 53 14.11	2.0345	S. 13 3 24.0	13.789
1	21 55 15.98	2.0279	12 49 35.4	13.829
2	21 57 17.46	2.0215	12 35 44.5	13.867
3	21 59 18.56	2.0151	12 21 51.3	13.905
4	22 1 19.27	2.0088	12 7 55.9	13.941
5	22 3 19.61	2.0026	11 53 58.4	13.976
6	22 5 19.58	1.9965	11 39 58.8	14.009
7	22 7 19.19	1.9905	11 25 57.3	14.042
8	22 9 18.44	1.9845	11 11 53.8	14.073
9	22 11 17.33	1.9786	10 57 48.5	14.102
10	22 13 15.87	1.9728	10 43 41.5	14.131
11	22 15 14.07	1.9672	10 29 32.8	14.158
12	22 17 11.93	1.9616	10 15 22.5	14.184
13	22 19 9.46	1.9561	10 1 10.7	14.209
14	22 21 6.66	1.9507	9 46 57.4	14.233
15	22 23 3.54	1.9454	9 32 42.7	14.256
16	22 25 0.11	1.9403	9 18 26.7	14.277
17	22 26 56.37	1.9351	9 4 9.5	14.297
18	22 28 52.32	1.9300	8 49 51.1	14.317
19	22 30 47.97	1.9251	8 35 31.5	14.335
20	22 32 43.33	1.9203	8 21 10.9	14.352
21	22 34 38.40	1.9155	8 6 49.3	14.368
22	22 36 33.19	1.9108	7 52 26.7	14.383
23	22 38 27.70	1.9063	S. 7 38 3.3	14.397
	TUESDAY 22.			
0	22 40 21.94	1.9018	S. 7 23 39.1	14.409
1	22 42 15.92	1.8974	7 9 14.2	14.422
2	22 44 9.63	1.8930	6 54 48.5	14.433
3	22 46 3.08	1.8888	6 40 22.2	14.443
4	22 47 56.29	1.8848	6 25 55.3	14.452
5	22 49 49.25	1.8808	6 11 28.0	14.459
6	22 51 41.98	1.8768	5 57 0.2	14.467
7	22 53 34.47	1.8729	5 42 32.0	14.472
8	22 55 26.73	1.8692	5 28 3.5	14.477
9	22 57 18.77	1.8655	5 13 34.7	14.482
10	22 59 10.59	1.8619	4 59 5.6	14.486
11	23 1 2.20	1.8584	4 44 36.4	14.488
12	23 2 53.60	1.8550	4 30 7.1	14.489
13	23 4 44.80	1.8517	4 15 37.7	14.490
14	23 6 35.80	1.8485	4 1 8.3	14.490
15	23 8 26.62	1.8454	3 46 38.9	14.489
16	23 10 17.25	1.8423	3 32 9.6	14.487
17	23 12 7.70	1.8393	3 17 40.4	14.485
18	23 13 57.97	1.8364	3 3 11.4	14.481
19	23 15 48.07	1.8337	2 48 42.7	14.477
20	23 17 38.01	1.8310	2 34 14.2	14.472
21	23 19 27.79	1.8284	2 19 46.1	14.466
22	23 21 17.42	1.8259	2 5 18.3	14.459
23	23 23 6.90	1.8234	1 50 51.0	14.451
24	23 24 56.23	1.8211	S. 1 36 24.2	14.442

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 23.			
	h m s	s	° ′ ″	″
0	23 24 56.23	1.8211	S. 1 36 24.2	14.442
1	23 26 45.43	1.8188	1 21 57.9	14.434
2	23 28 34.49	1.8167	1 7 32.1	14.424
3	23 30 23.43	1.8146	0 53 7.0	14.413
4	23 32 12.24	1.8126	0 38 42.5	14.402
5	23 34 0.94	1.8107	0 24 18.7	14.391
6	23 35 49.52	1.8088	S. 0 9 55.7	14.377
7	23 37 38.00	1.8072	N. 0 4 26.5	14.363
8	23 39 26.38	1.8055	0 18 47.9	14.350
9	23 41 14.66	1.8038	0 33 8.5	14.335
10	23 43 2.84	1.8023	0 47 28.1	14.318
11	23 44 50.94	1.8010	1 1 46.7	14.302
12	23 46 38.96	1.7997	1 16 4.4	14.286
13	23 48 26.90	1.7984	1 30 21.0	14.267
14	23 50 14.77	1.7973	1 44 36.5	14.249
15	23 52 2.57	1.7962	1 58 50.9	14.230
16	23 53 50.31	1.7952	2 13 4.1	14.210
17	23 55 37.99	1.7943	2 27 16.1	14.189
18	23 57 25.62	1.7934	2 41 26.8	14.168
19	23 59 13.20	1.7927	2 55 36.3	14.147
20	0 1 0.74	1.7920	3 9 44.4	14.123
21	0 2 48.24	1.7914	3 23 51.1	14.100
22	0 4 35.71	1.7909	3 37 56.4	14.077
23	0 6 23.15	1.7905	N. 3 52 0.3	14.052
	THURSDAY 24.			
0	0 8 10.57	1.7902	N. 4 6 2.6	14.026
1	0 9 57.97	1.7899	4 20 3.4	14.001
2	0 11 45.36	1.7898	4 34 2.7	13.974
3	0 13 32.74	1.7896	4 48 0.3	13.947
4	0 15 20.11	1.7895	5 1 56.3	13.918
5	0 17 7.48	1.7896	5 15 50.5	13.890
6	0 18 54.86	1.7898	5 29 43.1	13.862
7	0 20 42.25	1.7899	5 43 33.9	13.832
8	0 22 29.65	1.7902	5 57 22.9	13.801
9	0 24 17.07	1.7905	6 11 10.0	13.769
10	0 26 4.51	1.7909	6 24 55.2	13.737
11	0 27 51.98	1.7915	6 38 38.5	13.705
12	0 29 39.49	1.7921	6 52 19.8	13.672
13	0 31 27.03	1.7928	7 5 59.1	13.638
14	0 33 14.62	1.7935	7 19 36.4	13.604
15	0 35 2.25	1.7942	7 33 11.6	13.569
16	0 36 49.92	1.7951	7 46 44.7	13.533
17	0 38 37.66	1.7961	8 0 15.6	13.497
18	0 40 25.45	1.7971	8 13 44.4	13.461
19	0 42 13.31	1.7983	8 27 10.9	13.422
20	0 44 1.24	1.7994	8 40 35.1	13.384
21	0 45 49.24	1.8007	8 53 57.0	13.345
22	0 47 37.32	1.8020	9 7 16.5	13.306
23	0 49 25.48	1.8033	9 20 33.7	13.266
24	0 51 13.72	1.8048	N. 9 33 48.4	13.224

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Di fo 1 M
	FRIDAY 25.					SUNDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	′
0	0 51 13.72	1.8048	N. 9 33 48.4	13.224	0	2 20 47.23	1.9492	N. 19 8 27.1	10
1	0 53 2.05	1.8063	9 47 0.6	13.182	1	2 22 44.31	1.9535	19 18 51.1	10
2	0 54 50.48	1.8080	10 0 10.3	13.141	2	2 24 41.65	1.9578	19 29 10.4	10
3	0 56 39.01	1.8096	10 13 17.5	13.098	3	2 26 39.25	1.9622	19 39 25.1	10
4	0 58 27.63	1.8113	10 26 22.1	13.055	4	2 28 37.11	1.9666	19 49 35.0	10
5	1 0 16.37	1.8132	10 39 24.1	13.010	5	2 30 35.24	1.9710	19 59 40.1	10
6	1 2 5.21	1.8150	10 52 23.3	12.965	6	2 32 33.63	1.9754	20 9 40.4	9.
7	1 3 54.17	1.8170	11 5 19.9	12.920	7	2 34 32.29	1.9800	20 19 35.9	9.
8	1 5 43.25	1.8190	11 18 13.7	12.873	8	2 36 31.23	1.9846	20 29 26.4	9.
9	1 7 32.45	1.8211	11 31 4.7	12.827	9	2 38 30.44	1.9891	20 39 11.8	9.
10	1 9 21.78	1.8233	11 43 52.9	12.780	10	2 40 29.92	1.9937	20 48 52.2	9.
11	1 11 11.24	1.8255	11 56 38.3	12.732	11	2 42 29.68	1.9983	20 58 27.6	9.
12	1 13 0.84	1.8278	12 9 20.7	12.682	12	2 44 29.71	2.0029	21 7 57.8	9.
13	1 14 50.58	1.8302	12 22 0.2	12.632	13	2 46 30.03	2.0077	21 17 22.8	9.
14	1 16 40.46	1.8326	12 34 36.6	12.582	14	2 48 30.63	2.0123	21 26 42.5	9.
15	1 18 30.49	1.8351	12 47 10.1	12.532	15	2 50 31.51	2.0170	21 35 56.9	9.
16	1 20 20.67	1.8376	12 59 40.5	12.481	16	2 52 32.67	2.0218	21 45 6.0	9.
17	1 22 11.00	1.8402	13 12 7.8	12.428	17	2 54 34.12	2.0265	21 54 9.7	9.
18	1 24 1.49	1.8428	13 24 31.9	12.375	18	2 56 35.85	2.0313	22 3 7.9	8.
19	1 25 52.14	1.8456	13 36 52.8	12.321	19	2 58 37.87	2.0361	22 12 0.6	8.
20	1 27 42.96	1.8484	13 49 10.4	12.267	20	3 0 40.18	2.0409	22 20 47.7	8.
21	1 29 33.95	1.8513	14 1 24.8	12.212	21	3 2 42.78	2.0458	22 29 29.2	8.
22	1 31 25.11	1.8542	14 13 35.8	12.156	22	3 4 45.67	2.0507	22 38 4.9	8.
23	1 33 16.45	1.8572	N. 14 25 43.5	12.099	23	3 6 48.86	2.0555	N. 22 46 35.0	8.
	SATURDAY 26.					MONDAY 28.			
0	1 35 7.97	1.8602	N. 14 37 47.7	12.042	0	3 8 52.33	2.0603	N. 22 54 59.3	8.
1	1 36 59.67	1.8633	14 49 48.5	11.984	1	3 10 56.09	2.0651	23 3 17.7	8.
2	1 38 51.56	1.8664	15 1 45.8	11.925	2	3 13 0.14	2.0700	23 11 30.2	8.
3	1 40 43.64	1.8697	15 13 39.5	11.865	3	3 15 4.49	2.0749	23 19 36.8	8.
4	1 42 35.92	1.8730	15 25 29.6	11.805	4	3 17 9.13	2.0798	23 27 37.4	7.
5	1 44 28.40	1.8763	15 37 16.1	11.744	5	3 19 14.06	2.0846	23 35 31.9	7.
6	1 46 21.08	1.8797	15 48 58.9	11.682	6	3 21 19.28	2.0894	23 43 20.3	7.
7	1 48 13.96	1.8831	16 0 38.0	11.620	7	3 23 24.79	2.0943	23 51 2.5	7.
8	1 50 7.05	1.8866	16 12 13.3	11.557	8	3 25 30.60	2.0993	23 58 38.5	7.
9	1 52 0.35	1.8901	16 23 44.8	11.492	9	3 27 36.70	2.1041	24 6 8.2	7.
10	1 53 53.86	1.8937	16 35 12.4	11.427	10	3 29 43.09	2.1089	24 13 31.6	7.
11	1 55 47.59	1.8974	16 46 36.1	11.362	11	3 31 49.77	2.1138	24 20 48.6	7.
12	1 57 41.55	1.9012	16 57 55.9	11.297	12	3 33 56.75	2.1188	24 27 59.2	7.
13	1 59 35.73	1.9048	17 9 11.7	11.229	13	3 36 4.02	2.1235	24 35 3.3	7.
14	2 1 30.13	1.9086	17 20 23.4	11.161	14	3 38 11.57	2.1283	24 42 0.8	6.
15	2 3 24.76	1.9124	17 31 31.0	11.092	15	3 40 19.41	2.1330	24 48 51.7	6.
16	2 5 19.62	1.9163	17 42 34.5	11.022	16	3 42 27.53	2.1378	24 55 36.0	6.
17	2 7 14.72	1.9203	17 53 33.7	10.952	17	3 44 35.95	2.1427	25 2 13.5	6.
18	2 9 10.06	1.9243	18 4 28.7	10.882	18	3 46 44.65	2.1473	25 8 44.3	6.
19	2 11 5.63	1.9283	18 15 19.5	10.810	19	3 48 53.63	2.1520	25 15 8.3	6.
20	2 13 1.45	1.9324	18 26 5.9	10.737	20	3 51 2.89	2.1568	25 21 25.4	6.
21	2 14 57.52	1.9366	18 36 47.9	10.663	21	3 53 12.44	2.1614	25 27 35.6	6.
22	2 16 53.84	1.9408	18 47 25.5	10.589	22	3 55 22.26	2.1660	25 33 38.8	5.
23	2 18 50.41	1.9449	18 57 58.6	10.513	23	3 57 32.36	2.1706	25 39 35.0	5.
24	2 20 47.23	1.9492	N. 19 8 27.1	10.437	24	3 59 42.73	2.1752	N. 25 45 24.1	5.

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	3 59 42.73	2.1752	N. 25 45 24.1	5.759
1	4 1 53.38	2.1797	25 51 6.1	5.640
2	4 4 4.29	2.1842	25 56 40.9	5.519
3	4 6 15.48	2.1887	26 2 8.4	5.398
4	4 8 26.93	2.1930	26 7 28.7	5.277
5	4 10 38.64	2.1974	26 12 41.7	5.155
6	4 12 50.62	2.2018	26 17 47.3	5.031
7	4 15 2.85	2.2060	26 22 45.4	4.907
8	4 17 15.34	2.2103	26 27 36.1	4.782
9	4 19 28.08	2.2144	26 32 19.2	4.656
10	4 21 41.07	2.2185	26 36 54.8	4.530
11	4 23 54.30	2.2226	26 41 22.8	4.402
12	4 26 7.78	2.2267	26 45 43.1	4.274
13	4 28 21.50	2.2306	26 49 55.7	4.146
14	4 30 35.45	2.2345	26 54 0.6	4.016
15	4 32 49.64	2.2383	26 57 57.6	3.885
16	4 35 4.05	2.2421	27 1 46.8	3.754
17	4 37 18.69	2.2458	27 5 28.1	3.622
18	4 39 33.55	2.2495	27 9 1.5	3.490
19	4 41 48.63	2.2531	27 12 26.9	3.357
20	4 44 3.92	2.2566	27 15 44.3	3.222
21	4 46 19.42	2.2600	27 18 53.6	3.088
22	4 48 35.12	2.2633	27 21 54.9	2.953
23	4 50 51.02	2.2666	N. 27 24 48.0	2.818

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	4 53 7.11	2.2698	N. 27 27 33.0	2.682
1	4 55 23.40	2.2730	27 30 9.8	2.544
2	4 57 39.87	2.2760	27 32 38.3	2.406
3	4 59 56.52	2.2791	27 34 58.5	2.267
4	5 2 13.36	2.2820	27 37 10.4	2.129
5	5 4 30.36	2.2848	27 39 14.0	1.990
6	5 6 47.53	2.2875	27 41 9.2	1.849
7	5 9 4.86	2.2901	27 42 55.9	1.709
8	5 11 22.34	2.2927	27 44 34.3	1.569
9	5 13 39.98	2.2953	27 46 4.2	1.427
10	5 15 57.77	2.2976	27 47 25.6	1.286
11	5 18 15.69	2.2998	27 48 38.5	1.143
12	5 20 33.75	2.3021	27 49 42.8	1.000
13	5 22 51.94	2.3042	27 50 38.5	0.857
14	5 25 10.25	2.3061	27 51 25.7	0.714
15	5 27 28.67	2.3080	27 52 4.2	0.570
16	5 29 47.21	2.3099	27 52 34.1	0.426
17	5 32 5.86	2.3117	27 52 55.3	0.281
18	5 34 24.61	2.3132	27 53 7.8	+0.137
19	5 36 43.44	2.3147	27 53 11.7	−0.008
20	5 39 2.37	2.3162	27 53 6.8	0.154
21	5 41 21.38	2.3175	27 52 53.2	0.300
22	5 43 40.47	2.3188	27 52 30.8	0.447
23	5 45 59.63	2.3199	27 51 59.6	0.592
24	5 48 18.86	2.3210	N. 27 51 19.7	0.738

THURSDAY 31.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	5 48 18.86	2.3210	N. 27 51 19.7	0.738
1	5 50 38.15	2.3219	27 50 31.0	0.886
2	5 52 57.49	2.3227	27 49 33.4	1.032
3	5 55 16.87	2.3234	27 48 27.1	1.179
4	5 57 36.30	2.3241	27 47 11.9	1.327
5	5 59 55.76	2.3247	27 45 47.9	1.473
6	6 2 15.26	2.3251	27 44 15.1	1.620
7	6 4 34.77	2.3253	27 42 33.5	1.767
8	6 6 54.30	2.3257	27 40 43.0	1.915
9	6 9 13.85	2.3258	27 38 43.7	2.062
10	6 11 33.40	2.3258	27 36 35.6	2.208
11	6 13 52.95	2.3258	27 34 18.7	2.356
12	6 16 12.49	2.3256	27 31 52.9	2.503
13	6 18 32.02	2.3253	27 29 18.3	2.650
14	6 20 51.53	2.3250	27 26 34.9	2.797
15	6 23 11.02	2.3246	27 23 42.6	2.945
16	6 25 30.48	2.3240	27 20 41.5	3.092
17	6 27 49.90	2.3233	27 17 31.6	3.237
18	6 30 9.28	2.3226	27. 14 13.0	3.383
19	6 32 28.61	2.3218	27 10 45.6	3.530
20	6 34 47.89	2.3209	27 7 9.4	3.677
21	6 37 7.12	2.3199	27 3 24.4	3.822
22	6 39 26.28	2.3188	26 59 30.7	3.967
23	6 41 45.37	2.3175	N. 26 55 28.3	4.112

FRIDAY, JANUARY 1, 1915.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	6 44 4.38	2.3162	N. 26 51 17.2	4.257

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Dec.	2	6	20.6
☾	Last Quarter		9	23	31.7
●	New Moon		16	14	35.1
☽	First Quarter		23	20	24.8

			d	h
☾	Perigee	Dec.	15	2.2
☾	Apogee		27	0.7

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 44 44.91	+16.410	−23 45 57.8	−23.32	23 6.1
2	17 51 20.11	16.522	23 54 42.4	20.38	23 8.8
3	17 57 57.94	16.629	24 2 15.5	17.36	23 11.5
4	18 4 38.25	16.729	24 8 35.4	14.28	23 14.3
5	18 11 20.89	16.823	24 13 40.8	11.15	23 17.1
6	18 18 5.72	+16.912	−24 17 30.1	− 7.96	23 19.9
7	18 24 52.62	16.996	24 20 2.2	4.71	23 22.8
8	18 31 41.47	17.074	24 21 15.7	− 1.41	23 25.7
9	18 38 32.14	17.148	24 21 9.4	+ 1.94	23 28.6
10	18 45 24.52	17.217	24 19 42.2	5.33	23 31.6
11	18 52 18.49	+17.281	−24 16 52.9	+ 8.77	23 34.6
12	18 59 13.95	17.340	24 12 40.5	12.26	23 37.6
13	19 6 10.78	17.395	24 7 4.0	15.78	23 40.6
14	19 13 8.88	17.446	24 0 2.5	19.34	23 43.7
15	19 20 8.15	17.493	23 51 35.0	22.94	23 46.8
16	19 27 8.48	+17.535	−23 41 40.7	+26.58	23 49.9
17	19 34 9.76	17.572	23 30 18.6	30.26	23 53.0
18	19 41 11.89	17.605	23 17 28.1	33.96	23 56.1
19	19 48 14.77	17.634	23 3 8.4	37.69	23 59.2
20	19 55 18.29	17.659	22 47 18.9	41.45	. . . . .
21	20 2 22.35	+17.679	−22 29 59.0	+45.23	0 2.4
22	20 9 26.83	17.694	22 11 7.9	49.03	0 5.5
23	20 16 31.63	17.705	21 50 45.3	52.85	0 8.6
24	20 23 36.63	17.711	21 28 50.9	56.69	0 11.7
25	20 30 41.72	17.712	21 5 24.3	60.54	0 14.9
26	20 37 46.76	+17.708	−20 40 25.2	+64.39	0 18.1
27	20 44 51.62	17.697	20 13 53.6	68.24	0 21.3
28	20 51 56.16	17.680	19 45 49.6	72.09	0 24.4
29	20 59 0.23	17.657	19 16 13.4	75.92	0 27.5
30	21 6 3.65	17.626	18 45 5.4	79.72	0 30.6
31	21 13 6.22	+17.587	−18 12 26.2	+83.52	0 33.7
32	21 20 7.74	+17.538	−17 38 16.8	+87.26	0 36.8

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	2.47	2.41	2.36	2.34	2.35	2.38	2.44
Horizontal Parallax	6.51	6.34	6.22	6.17	6.18	6.26	6.42

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 20 7.74	+17.538	−17 38 16.8	+ 87.26	0 36.8
2	21 27 7.94	17.477	17 2 38.4	90.93	0 39.9
3	21 34 6.54	17.404	16 25 32.7	94.52	0 42.9
4	21 41 3.21	17.316	15 47 1.8	98.02	0 45.9
5	21 47 57.57	17.210	15 7 8.2	101.41	0 48.9
6	21 54 49.15	+17.085	−14 25 55.2	+104.64	0 51.8
7	22 1 37.45	16.936	13 43 26.9	107.68	0 54.7
8	22 8 21.85	16.759	12 59 48.2	110.51	0 57.5
9	22 15 1.64	16.551	12 15 4.7	113.07	1 0.2
10	22 21 36.01	16.307	11 29 23.4	115.31	1 2.8
11	22 28 4.03	+16.021	−10 42 52.5	+117.19	1 5.3
12	22 34 24.62	15.687	9 55 41.7	118.64	1 7.7
13	22 40 36.55	15.298	9 8 2.0	119.59	1 10.0
14	22 46 38.45	14.849	8 20 6.0	119.98	1 12.1
15	22 52 28.80	14.334	7 32 8.1	119.73	1 14.0
16	22 58 5.92	+13.746	− 6 44 24.6	+118.78	1 15.7
17	23 3 27.96	13.078	5 57 13.1	117.05	1 17.1
18	23 8 32.97	12.326	5 10 53.1	114.48	1 18.2
19	23 13 18.88	11.486	4 25 45.4	111.02	1 19.0
20	23 17 43.57	10.557	3 42 12.0	106.61	1 19.4
21	23 21 44.89	+ 9.538	− 3 0 35.8	+101.24	1 19.5
22	23 25 20.73	8.433	2 21 20.1	94.90	1 19.1
23	23 28 29.05	7.246	1 44 48.4	87.98	1 18.3
24	23 31 7.99	5.986	1 11 23.7	79.32	1 17.0
25	23 33 15.93	4.665	0 41 28.2	70.16	1 15.2
26	23 34 51.54	+ 3.295	− 0 15 22.7	+ 60.17	1 12.8
27	23 35 53.86	1.894	+ 0 6 34.0	49.44	1 9.8
28	23 36 22.39	+ 0.483	0 24 5.6	38.09	1 6.3
29	23 36 17.17	− 0.914	0 36 58.9	26.27	1 2.3
30	23 35 38.81	2.273	0 45 4.3	14.24	0 57.7
31	23 34 28.56	− 3.567	+ 0 48 16.9	+ 1.90	0 52.6
32	23 32 48.32	− 4.767	+ 0 46 36.7	− 10.22	0 47.0

Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″
Semidiameter	2.53	2.70	2.96	3.35	3.89
Horizontal Parallax . . .	6.68	7.12	7.80	8.82	10.26

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 36 17.17	−0.924	+0 36 58.9	+26.27	1 2.3
2	23 35 38.81	2.273	0 45 4.3	14.14	0 57.7
3	23 34 28.56	3.567	0 48 16.9	+ 1.90	0 52.6
4	23 32 48.32	4.767	0 46 36.7	−10.22	0 47.0
5	23 30 40.68	5.846	0 40 9.3	21.98	0 40.9
6	23 28 8.86	−6.778	+0 29 6.3	−33.13	0 34.5
7	23 25 16.67	7.541	+0 13 45.5	43.43	0 27.7
8	23 22 8.38	8.117	−0 5 29.7	52.64	0 20.7
9	23 18 48.63	8.496	0 28 10.5	60.54	0 13.4
10	23 15 22.23	8.672	0 53 43.7	66.98	0 6.1 23 58.8
11	23 11 54.01	−8.649	−1 21 32.9	−71.86	23 51.4
12	23 8 28.63	8.436	1 51 0.1	75.14	23 44.1
13	23 5 10.47	8.090	2 21 27.1	76.85	23 37.1
14	23 2 3.46	7.521	2 52 17.2	77.08	23 30.3
15	22 59 10.98	6.843	3 22 56.0	75.94	23 23.8
16	22 56 35.83	−6.071	−3 52 52.6	−73.59	23 17.6
17	22 54 20.20	5.200	4 21 40.3	70.22	23 11.8
18	22 52 25.71	4.314	4 48 56.4	66.00	23 6.3
19	22 50 53.43	3.373	5 14 22.9	61.11	23 1.2
20	22 49 43.95	2.427	5 37 45.7	55.72	22 56.5
21	22 48 57.44	−1.461	−5 58 54.4	−49.96	22 52.2
22	22 48 33.73	−0.518	6 17 41.7	43.96	22 48.2
23	22 48 32.38	+0.401	6 34 3.3	37.83	22 44.6
24	22 48 52.72	1.289	6 47 57.1	31.65	22 41.3
25	22 49 33.96	2.141	6 59 22.7	25.49	22 38.4
26	22 50 35.19	+2.954	−7 8 20.9	−19.39	22 35.8
27	22 51 55.43	3.725	7 14 53.9	13.39	22 33.5
28	22 53 33.68	4.455	7 19 4.5	7.52	22 31.4
29	22 55 28.93	5.142	7 20 56.1	− 1.80	22 29.6
30	22 57 40.18	5.788	7 20 32.5	+ 3.75	22 28.1
31	23 0 6.47	+6.396	−7 17 57.5	+ 9.14	22 26.8
32	23 2 46.88	+6.965	−7 13 15.0	+14.37	22 25.8

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 2 46.88	+ 6.965	−7 13 15.0	+ 14.37	22 25.8
2	23 5 40.52	7.498	7 6 29.1	19.43	22 24.9
3	23 8 46.57	8.000	6 57 43.9	24.33	22 24.3
4	23 12 4.26	8.470	6 47 5.1	29.06	22 23.8
5	23 15 32.87	8.911	6 34 30.5	33.63	22 23.5
6	23 19 11.76	+ 9.326	−6 20 9.8	+ 38.06	22 23.4
7	23 23 0.32	9.727	6 4 4.4	42.36	22 23.4
8	23 26 58.00	10.086	5 46 17.6	46.52	22 23.5
9	23 31 4.32	10.436	5 26 52.5	50.55	22 23.8
10	23 35 18.82	10.769	5 5 58.2	54.45	22 24.2
11	23 39 41.11	+11.086	−4 43 19.6	+ 58.24	22 24.8
12	23 44 10.84	11.389	4 19 17.5	61.92	22 25.4
13	23 48 47.70	11.681	3 53 48.6	65.48	22 26.2
14	23 53 31.43	11.962	3 26 55.4	68.94	22 27.1
15	23 58 21.80	12.234	2 58 40.3	72.30	22 28.1
16	0 3 18.61	+12.499	−2 29 5.8	+ 75.56	22 29.2
17	0 8 21.71	12.756	1 58 14.3	78.72	22 30.4
18	0 13 30.98	13.013	1 26 8.1	81.79	22 31.7
19	0 18 46.34	13.266	0 52 49.3	84.77	22 33.1
20	0 24 7.73	13.517	−0 18 20.2	87.66	22 34.6
21	0 29 35.14	+13.767	+0 17 17.1	+ 90.45	22 36.3
22	0 35 8.56	14.019	0 54 0.4	93.15	22 38.0
23	0 40 48.04	14.273	1 31 47.5	95.76	22 39.8
24	0 46 33.65	14.530	2 10 36.1	98.28	22 41.7
25	0 52 25.47	14.790	2 50 24.0	100.70	22 43.7
26	0 58 23.62	+15.057	+3 31 8.8	+103.02	22 45.8
27	1 4 28.26	15.331	4 12 48.1	105.24	22 48.1
28	1 10 39.54	15.612	4 55 19.2	107.35	22 50.5
29	1 16 57.66	15.901	5 38 39.5	109.33	22 52.9
30	1 23 22.82	16.198	6 22 45.9	111.18	22 55.5
31	1 29 55.26	+16.506	+7 7 35.1	+112.89	22 58.2
32	1 36 35.20	+16.804	+7 53 3.7	+114.46	23 1.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter	4.55	5.14	5.43	5.35	5.02	4.61
Horizontal Parallax	11.98	13.54	14.32	14.10	13.23	12.15

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″
Semidiameter . . .	4.21	3.86	3.56	3.30	3.08	2.90
Horizontal Parallax	11.10	10.18	9.38	8.70	8.12	7.63

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations decreasing; the sign − indicates that north declinations are decreasing or south declinations increasing.

MERCURY, 1914.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Merid ianPa sage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	1 29 55.26	+16.506	+ 7 7 35.1	+112.89	22 58.2	1	5 46 9.89	+20.223	+25 29 28.4	+12.51	1 9.
2	1 36 35.20	16.824	7 53 3.7	114.46	23 1.1	2	5 54 9.75	19.761	25 33 18.4	6.70	1 13.
3	1 43 22.90	17.152	8 39 7.8	115.85	23 4.1	3	6 1 58.24	19.276	25 34 52.0	+ 1.15	1 17.
4	1 50 18.61	17.491	9 25 43.0	117.05	23 7.2	4	6 9 34.85	18.771	25 34 15.6	− 4.13	1 21.
5	1 57 22.57	17.841	10 12 44.6	118.05	23 10.5	5	6 16 59.13	18.249	25 31 35.9	9.13	1 24.
6	2 4 35.04	+18.200	+11 0 7.4	+118.81	23 13.9	6	6 24 10.71	+17.713	+25 26 59.7	−13.84	1 28.
7	2 11 56.22	18.568	11 47 45.4	119.31	23 17.5	7	6 31 9.26	17.164	25 20 34.1	18.25	1 31.
8	2 19 26.32	18.942	12 35 32.0	119.52	23 21.2	8	6 37 54.49	16.604	25 12 26.1	22.37	1 34.
9	2 27 5.48	19.322	13 23 20.1	119.42	23 25.0	9	6 44 26.14	16.033	25 2 42.7	26.20	1 36.
10	2 34 53.79	19.704	14 11 1.4	118.96	23 29.1	10	6 50 43.97	15.451	24 51 30.8	29.74	1 38.
11	2 42 51.28	+20.086	+14 58 27.1	+118.11	23 33.3	11	6 56 47.76	+14.862	+24 38 57.3	−33.00	1 41.
12	2 50 57.87	20.463	15 45 27.6	116.85	23 37.6	12	7 2 37.31	14.264	24 25 8.9	35.98	1 42.
13	2 59 13.40	20.830	16 31 52.4	115.14	23 42.1	13	7 8 12.41	13.658	24 10 12.4	38.68	1 44.
14	3 7 37.58	21.182	17 17 30.3	112.94	23 46.7	14	7 13 32.85	13.043	23 54 14.3	41.11	1 45.
15	3 16 9.96	21.513	18 2 9.5	110.24	23 51.4	15	7 18 38.43	12.420	23 37 21.2	43.27	1 47.
16	3 24 49.99	+21.817	+18 45 37.7	+107.03	23 56.2	16	7 23 28.92	+11.787	+23 19 39.4	−45.17	1 47.
17	3 33 36.94	22.089	19 27 42.6	103.30	. . . . .	17	7 28 4.11	11.144	23 1 15.2	46.80	1 48.
18	3 42 29.95	22.321	20 8 11.8	99.05	0 1.2	18	7 32 23.74	10.490	22 42 15.0	48.17	1 48.
19	3 51 28.00	22.508	20 46 53.1	94.31	0 6.2	19	7 36 27.54	9.825	22 22 45.1	49.28	1 49.
20	4 0 29.96	22.646	21 23 35.1	89.11	0 11.3	20	7 40 15.25	9.149	22 2 51.6	50.13	1 48.8
21	4 9 34.60	+22.731	+21 58 7.2	+ 83.50	0 16.5	21	7 43 46.59	+ 8.460	+21 42 40.8	−50.72	1 48.3
22	4 18 40.60	22.760	22 30 20.2	77.54	0 21.7	22	7 47 1.26	7.759	21 22 18.7	51.06	1 47.6
23	4 27 46.60	22.732	23 0 6.3	71.27	0 26.9	23	7 49 58.94	7.044	21 1 51.7	51.14	1 46.6
24	4 36 51.24	22.646	23 27 19.0	64.77	0 32.0	24	7 52 39.30	6.316	20 41 26.0	50.96	1 45.3
25	4 45 53.15	22.504	23 51 53.9	58.12	0 37.1	25	7 55 2.01	5.574	20 21 7.7	50.52	1 43.8
26	4 54 51.02	+22.309	+24 13 48.1	+ 51.38	0 42.1	26	7 57 6.76	+ 4.819	+20 1 3.2	−49.81	1 41.9
27	5 3 43.60	22.064	24 33 0.3	44.63	0 47.1	27	7 58 53.21	4.050	19 41 18.8	48.84	1 39.7
28	5 12 29.73	21.772	24 49 30.8	37.93	0 51.9	28	8 0 21.08	3.270	19 22 0.8	47.61	1 37.2
29	5 21 8.34	21.438	25 3 21.4	31.32	0 56.6	29	8 1 30.10	2.480	19 3 15.6	46.11	1 34.4
30	5 29 38.47	21.066	25 14 35.1	24.85	1 1.2	30	8 2 20.06	1.682	18 45 9.5	44.35	1 31.3
31	5 37 59.24	+20.660	+25 23 15.8	+ 18.57	1 5.6	31	8 2 50.80	+ 0.880	+18 27 48.6	−42.33	1 27.8
32	5 46 9.89	+20.223	+25 29 28.4	+ 12.51	1 9.8	32	8 3 2.28	+ 0.077	+18 11 19.2	−40.06	1 24.1

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	2.75	2.63	2.55	2.52	2.56	2.67	2.86
Horizontal Parallax	7.23	6.92	6.72	6.65	6.75	7.05	7.53

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . . .	3.10	3.40	3.75	4.16	4.60	5.06
Horizontal Parallax	8.17	8.96	9.89	10.95	12.11	13.33

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	8 2 50.80	+0.880	+18 27 48.6	−42.33	1 27.8	1	7 25 29.17	+ 5.803	+19 17 44.9	+ 27.30	22 47.2
2	8 3 2.28	+0.077	18 11 19.2	40.06	1 24.1	2	7 28 1.92	6.925	19 28 15.4	25.17	22 46.2
3	8 2 54.53	−0.722	17 55 47.5	37.54	1 20.0	3	7 31 1.53	8.040	19 37 49.2	22.58	22 45.7
4	8 2 27.72	1.510	17 41 19.3	34.78	1 15.6	4	7 34 27.72	9.140	19 46 15.3	19.53	22 45.6
5	8 1 42.19	2.281	17 28 0.0	31.80	1 10.9	5	7 38 20.09	10.220	19 53 22.6	16.01	22 45.9
6	8 0 38.45	−3.026	+17 15 54.9	−28.60	1 5.9	6	7 42 38.07	+11.273	+19 58 59.8	+ 12.02	22 46.6
7	7 59 17.22	3.737	17 5 8.7	25.21	1 0.6	7	7 47 20.95	12.294	20 2 55.9	7.58	22 47.8
8	7 57 39.43	4.404	16 55 45.8	21.66	0 55.0	8	7 52 27.87	13.276	20 5 0.2	+ 2.70	22 49.3
9	7 55 46.28	5.016	16 47 49.8	17.98	0 49.2	9	7 57 57.81	14.211	20 5 2.1	− 2.61	22 51.2
10	7 53 39.20	5.563	16 41 23.6	14.19	0 43.2	10	8 3 49.57	15.093	20 2 51.9	8.31	22 53.5
11	7 51 19.88	−6.034	+16 36 29.3	−10.33	0 37.0	11	8 10 1.79	+15.915	+19 58 20.6	− 14.35	22 56.1
12	7 48 50.29	6.418	16 33 8.1	6.43	0 30.6	12	8 16 32.95	16.670	19 51 20.5	20.69	22 58.9
13	7 46 12.61	6.706	16 31 20.4	− 2.54	0 24.0	13	8 23 21.37	17.352	19 41 45.4	27.27	23 2.0
14	7 43 29.24	6.890	16 31 5.5	+ 1.30	0 17.4	14	8 30 25.23	17.956	19 29 30.4	34.01	23 5.4
15	7 40 42.77	6.964	16 32 21.8	5.05	0 10.7	15	8 37 42.61	18.478	19 14 32.4	40.83	23 8.9
16	7 37 55.91	−6.922	+16 35 6.8	+ 8.67	0 4.0 23 57.3	16	8 45 11.49	+18.915	+18 56 50.5	− 47.65	23 12.6
17	7 35 11.46	6.762	16 39 16.9	12.13	23 50.7	17	8 52 49.85	19.267	18 36 25.8	54.39	23 16.5
18	7 32 32.24	6.486	16 44 47.6	15.39	23 44.3	18	9 0 35.65	19.535	18 13 21.2	60.97	23 20.4
19	7 30 1.04	6.095	16 51 33.8	18.42	23 38.1	19	9 8 26.90	19.722	17 47 41.4	67.31	23 24.4
20	7 27 40.56	5.594	16 59 29.6	21.19	23 32.0	20	9 16 21.71	19.833	17 19 32.8	73.35	23 28.4
21	7 25 33.37	−4.989	+17 8 28.4	+23.66	23 26.2	21	9 24 18.33	+19.874	+16 49 3.4	− 79.03	23 32.4
22	7 23 41.85	4.289	17 18 23.0	25.83	23 20.7	22	9 32 15.15	19.851	16 16 22.2	84.33	23 36.4
23	7 22 8.18	3.503	17 29 5.9	27.68	23 15.6	23	9 40 10.74	19.773	15 41 38.8	89.21	23 40.3
24	7 20 54.30	2.642	17 40 28.8	29.18	23 10.8	24	9 48 3.87	19.647	15 5 3.5	93.65	23 44.2
25	7 20 1.91	1.715	17 52 23.4	30.32	23 6.4	25	9 55 53.49	19.481	14 26 46.8	97.66	23 48.0
26	7 19 32.45	−0.732	+18 4 41.1	+31.09	23 2.3	26	10 3 38.73	+19.283	+13 46 59.0	−101.24	23 51.7
27	7 19 27.13	+0.296	18 17 12.7	31.48	22 58.7	27	10 11 18.89	19.060	13 5 50.5	104.40	23 55.4
28	7 19 46.91	1.359	18 29 49.0	31.48	22 55.5	28	10 18 53.44	18.818	12 23 31.0	107.16	23 59.0
29	7 20 32.55	2.449	18 42 20.3	31.07	22 52.7	29	10 26 22.01	18.562	11 40 10.0	109.54	. . . . .
30	7 21 44.60	3.558	18 54 36.9	30.24	22 50.4	30	10 33 44.32	18.297	10 55 56.1	111.56	0 2.4
31	7 23 23.41	+4.678	+19 6 28.5	+28.99	22 48.6	31	10 41 0.21	+18.027	+10 10 57.6	−113.26	0 5.7
32	7 25 29.17	+5.803	+19 17 44.9	+27.30	22 47.2	32	10 48 9.61	+17.757	+ 9 25 22.1	−114.65	0 8.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter	5.48	5.77	5.81	5.56	5.06	4.47	Semidiameter . . .	3.88	3.38	2.99	2.72	2.55	2.46
Horizontal Parallax	14.44	15.20	15.32	14.65	13.35	11.77	Horizontal Parallax	10.22	8.90	7.88	7.17	6.72	6.48

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign – indicates that north declinations are decreasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 48 9.61	+17.757	+ 9 25 22.1	−114.65	0 8.9	1	13 45 33.21	+12.753	−12 30 50.9	−90.55	1 8.1
2	10 55 12.54	17.488	8 39 16.5	115.77	0 12.0	2	13 50 37.89	12.637	13 6 40.2	88.54	1 9.2
3	11 2 9.05	17.223	7 52 47.1	116.63	0 15.0	3	13 55 39.73	12.515	13 41 40.4	86.46	1 10.3
4	11 8 59.27	16.964	7 5 59.8	117.26	0 18.0	4	14 0 38.57	12.387	14 15 49.6	84.29	1 11.3
5	11 15 43.34	16.721	6 18 59.9	117.69	0 20.8	5	14 5 34.22	12.249	14 49 5.8	82.04	1 12.3
6	11 22 21.44	+16.466	+ 5 31 52.1	−117.93	0 23.5	6	14 10 26.44	+12.101	−15 21 27.0	−79.71	1 13.2
7	11 28 53.78	16.230	4 44 40.9	117.99	0 26.1	7	14 15 14.96	11.940	15 52 50.8	77.27	1 14.1
8	11 35 20.57	16.003	3 57 30.1	117.89	0 28.6	8	14 19 59.44	11.764	16 23 14.8	74.72	1 14.9
9	11 41 42.03	15.786	3 10 23.4	117.65	0 31.0	9	14 24 39.49	11.570	16 52 36.4	72.04	1 15.6
10	11 47 58.39	15.578	2 23 24.0	117.28	0 33.3	10	14 29 14.65	11.356	17 20 52.8	69.28	1 16.3
11	11 54 9.88	+15.380	+ 1 36 34.9	−116.79	0 35.5	11	14 33 44.40	+11.118	−17 48 0.9	−66.36	1 16.8
12	12 0 16.71	15.191	0 49 58.9	116.19	0 37.7	12	14 38 8.13	10.854	18 13 57.3	63.30	1 17.3
13	12 6 19.11	15.011	+ 0 3 38.5	115.49	0 39.8	13	14 42 25.15	10.558	18 38 38.4	60.09	1 17.6
14	12 12 17.30	14.840	− 0 42 24.1	114.70	0 41.8	14	14 46 34.65	10.227	19 2 0.2	56.69	1 17.8
15	12 18 11.49	14.677	1 28 6.7	113.82	0 43.8	15	14 50 35.74	9.856	19 23 58.2	53.10	1 17.9
16	12 24 1.86	+14.522	− 2 13 27.2	−112.87	0 45.7	16	14 54 27.40	+ 9.440	−19 44 27.6	−49.30	1 17.8
17	12 29 48.61	14.375	2 58 23.9	111.84	0 47.5	17	14 58 8.47	8.973	20 3 23.0	45.26	1 17.5
18	12 35 31.91	14.235	3 42 54.9	110.73	0 49.3	18	15 1 37.66	8.449	20 20 38.4	40.96	1 17.1
19	12 41 11.91	14.101	4 26 58.6	109.56	0 51.0	19	15 4 53.51	7.861	20 36 7.0	36.36	1 16.4
20	12 46 48.77	13.972	5 10 35.2	108.31	0 52.7	20	15 7 54.41	7.202	20 49 41.4	31.44	1 15.4
21	12 52 22.62	+13.849	− 5 53 37.3	−107.01	0 54.3	21	15 10 38.58	+ 6.466	−21 1 13.2	−26.15	1 14.2
22	12 57 53.57	13.731	6 36 9.4	105.65	0 55.9	22	15 13 4.07	5.644	21 10 33.3	20.45	1 12.7
23	13 3 21.74	13.617	7 18 8.0	104.22	0 57.4	23	15 15 8.77	4.731	21 17 31.2	14.30	1 10.8
24	13 8 47.20	13.506	7 59 31.5	102.73	0 58.9	24	15 16 50.42	3.723	21 21 55.6	7.65	1 8.5
25	13 14 10.03	13.397	8 40 18.4	101.17	1 0.4	25	15 18 6.66	2.614	21 23 34.0	− 0.46	1 5.8
26	13 19 30.28	+13.290	− 9 20 27.4	− 99.56	1 1.8	26	15 18 55.08	+ 1.404	−21 22 12.9	+ 7.32	1 2.7
27	13 24 47.98	13.185	9 59 57.0	97.80	1 3.1	27	15 19 13.29	+ 0.097	21 17 37.7	15.72	0 59.0
28	13 30 3.14	13.080	10 38 45.7	96.16	1 4.4	28	15 18 59.03	− 1.300	21 9 33.7	24.72	0 54.8
29	13 35 15.76	12.973	11 16 52.0	94.36	1 5.7	29	15 18 10.34	2.769	20 57 46.1	34.33	0 50.0
30	13 40 25.80	12.864	11 54 14.3	92.49	1 6.9	30	15 16 45.77	4.285	20 42 1.4	44.47	0 44.7
31	13 45 33.21	+12.753	−12 30 50.9	− 90.55	1 8.1	31	15 14 44.56	− 5.814	−20 22 8.6	+54	
32	13 50 37.89	+12.637	−13 6 40.2	− 88.54	1 9.2	32	15 12 6.96	− 7.309	−19 58 1.0	+	

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.
	″	″	″	″	″	″		″	″	
Semidiameter	2.42	2.42	2.44	2.49	2.57	2.67	Semidiameter . . .	2.80	2.97	
Horizontal Parallax	6.38	6.37	6.44	6.57	6.77	7.03	Horizontal Parallax	7.38	7.8	

NOTE.—The sign + indicates north declinations; the sign — indicates so

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	15 12 6.96	− 7.309	−19 58 1.0	+ 65.66	0 32.2
2	15 8 54.46	8.712	19 29 38.7	76.15	0 25.1
3	15 5 10.04	9.958	18 57 11.1	86.01	0 17.5
4	15 0 58.29	10.978	18 20 59.4	94.73	0 9.4
5	14 56 25.44	11.706	17 41 37.8	101.73	0 0.9 23 52.3
6	14 51 39.20	−12.086	−16 59 54.6	+106.44	23 43.5
7	14 46 48.39	12.080	16 16 50.8	108.38	23 34.9
8	14 42 2.42	11.683	15 33 36.9	107.24	23 26.4
9	14 37 30.63	10.906	14 51 28.3	100.95	23 18.4
10	14 33 21.67	9.790	14 11 39.0	95.68	23 10.8
11	14 29 42.94	− 8.396	−13 35 16.1	+ 85.83	23 3.8
12	14 26 40.28	6.798	13 3 15.0	73.96	22 57.5
13	14 24 17.69	5.090	12 36 16.8	60.78	22 51.9
14	14 22 37.42	3.283	12 14 46.6	46.74	22 47.0
15	14 21 40.12	− 1.498	11 58 54.8	30.60	22 42.8
16	14 21 25.11	+ 0.234	−11 48 39.1	+ 18.80	22 39.2
17	14 21 50.67	1.878	11 43 46.4	+ 5.73	22 36.3
18	14 22 54.39	3.411	11 43 56.3	− 6.38	22 34.0
19	14 24 33.41	4.819	11 48 43.7	17.31	22 32.2
20	14 26 44.67	6.097	11 57 40.4	27.16	22 30.9
21	14 29 25.04	+ 7.246	−12 10 17.5	− 35.74	22 30.0
22	14 32 31.50	8.278	12 26 6.4	43.15	22 29.6
23	14 36 1.19	9.183	12 44 39.5	49.44	22 29.4
24	14 39 51.48	9.990	13 5 31.3	54.71	22 29.6
25	14 43 59.98	10.708	13 28 18.1	59.04	22 30.1
26	14 48 24.56	+11.338	−13 52 38.5	− 62.53	22 30.8
27	14 53 3.32	11.886	14 18 13.3	65.26	22 31.7
28	14 57 54.59	12.376	14 44 45.4	67.32	22 32.7
29	15 2 56.93	12.810	15 11 59.6	68.78	22 34.0
30	15 8 9.09	13.196	15 39 42.5	69.71	22 35.4
31	15 13 29.98	+13.539	−16 7 42.1	− 70.19	22 36.9
32	15 18 58.67	+13.846	−16 35 48.2	− 70.26	22 38.6

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	15 13 29.98	+13.539	−16 7 42.1	−70.19	22 36.9
2	15 18 58.67	13.846	16 35 48.2	70.26	22 38.6
3	15 24 34.35	14.122	17 3 51.6	69.97	22 40.4
4	15 30 16.34	14.373	17 31 44.2	69.37	22 42.2
5	15 36 4.06	14.600	17 59 18.9	68.49	22 44.1
6	15 41 56.99	+14.808	−18 26 29.5	−67.36	22 46.1
7	15 47 54.72	15.000	18 53 10.4	66.01	22 48.2
8	15 53 56.87	15.177	19 19 16.7	64.48	22 50.4
9	16 0 3.13	15.343	19 44 43.9	62.77	22 52.6
10	16 6 13.23	15.498	20 9 28.1	60.89	22 54.9
11	16 12 26.94	+15.643	−20 33 25.7	−58.88	22 57.3
12	16 18 44.05	15.781	20 56 33.5	56.75	22 59.7
13	16 25 4.39	15.912	21 18 48.6	54.50	23 2.1
14	16 31 27.80	16.037	21 40 8.4	52.13	23 4.6
15	16 37 54.15	16.157	22 0 30.2	49.66	23 7.1
16	16 44 23.31	+16.272	−22 19 51.8	−47.11	23 9.7
17	16 50 55.16	16.382	22 38 11.2	44.48	23 12.4
18	16 57 29.61	16.488	22 55 26.4	41.76	23 15.1
19	17 4 6.55	16.590	23 11 35.4	38.97	23 17.8
20	17 10 45.90	16.689	23 26 36.4	36.10	23 20.5
21	17 17 27.58	+16.784	−23 40 27.8	−33.17	23 23.3
22	17 24 11.49	16.876	23 53 8.1	30.17	23 26.1
23	17 30 57.56	16.964	24 4 35.6	27.11	23 29.0
24	17 37 45.71	17.040	24 14 48.9	23.99	23 31.9
25	17 44 35.86	17.131	24 23 46.7	20.81	23 34.9
26	17 51 27.93	+17.209	−24 31 27.5	−17.58	23 37.8
27	17 58 21.83	17.283	24 37 49.9	14.29	23 40.8
28	18 5 17.48	17.354	24 42 52.6	10.94	23 43.8
29	18 12 14.78	17.421	24 46 34.5	7.54	23 46.8
30	18 19 13.65	17.484	24 48 54.3	4.09	23 49.9
31	18 26 13.99	+17.544	−24 49 50.7	− 0.60	23 53.0
32	18 33 15.71	+17.599	−24 49 22.6	+ 2.94	23 56.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter	4.80	4.95	4.59	4.00	3.47	3.08
Horizontal Parallax	12.64	13.04	12.11	10.54	9.14	8.12

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter . . .	2.81	2.63	2.50	2.41	2.36	2.33	2.32
Horizontal Parallax	7.41	6.92	6.58	6.35	6.21	6.13	6.11

NOTE.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; the sign − indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	18 1 30.10	+13.712	−23 28 38.2	− 5.62	23 21.8
2	18 6 59.28	13.719	23 30 31.4	3.80	23 23.3
3	18 12 28.59	13.722	23 31 40.9	1.98	23 24.9
4	18 17 57.95	13.723	23 32 6.7	− 0.16	23 26.5
5	18 23 27.30	13.721	23 31 48.7	+ 1.66	23 28.0
6	18 28 56.58	+13.717	−23 30 47.0	+ 3.48	23 29.5
7	18 34 25.72	13.710	23 29 1.6	5.30	23 31.1
8	18 39 54.66	13.701	23 26 32.6	7.12	23 32.7
9	18 45 23.35	13.689	23 23 20.0	8.93	23 34.2
10	18 50 51.72	13.675	23 19 24.0	10.74	23 35.7
11	18 56 19.71	+13.658	−23 14 44.7	+ 12.54	23 37.2
12	19 1 47.28	13.639	23 9 22.3	14.33	23 38.7
13	19 7 14.36	13.618	23 3 17.1	16.11	23 40.2
14	19 12 40.90	13.594	22 56 29.2	17.88	23 41.7
15	19 18 6.85	13.568	22 48 59.0	19.64	23 43.2
16	19 23 32.15	+13.540	−22 40 46.7	+21.38	23 44.7
17	19 28 56.76	13.510	22 31 52.7	23.11	23 46.1
18	19 34 20.63	13.478	22 22 17.3	24.82	23 47.5
19	19 39 43.71	13.444	22 12 1.0	26.52	23 49.0
20	19 45 5.95	13.408	22 1 4.2	28.20	23 50.4
21	19 50 27.31	+13.371	−21 49 27.3	+29.86	23 51.8
22	19 55 47.74	13.332	21 37 10.7	31.50	23 53.2
23	20 1 7.21	13.291	21 24 15.1	33.12	23 54.6
24	20 6 25.68	13.248	21 10 41.0	34.71	23 55.9
25	20 11 43.11	13.204	20 56 28.9	36.28	23 57.2
26	20 16 59.46	+13.158	−20 41 39.3	+37.83	23 58.5
27	20 22 14.71	13.112	20 26 12.9	39.35	23 59.9
28	20 27 28.84	13.065	20 10 10.3	40.85	. . . . .
29	20 32 41.82	13.016	19 53 32.1	42.32	0 1.2
30	20 37 53.62	12.967	19 36 19.0	43.76	0 2.4
31	20 43 4.23	+12.917	−19 18 31.7	+45.17	0 3.6
32	20 48 13.62	+12.866	−19 0 10.7	+46.56	0 4.8

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	5.10	5.08	5.05	5.04	5.02	5.01	5.00
Horizontal Parallax	5.25	5.23	5.20	5.19	5.17	5.15	5.15

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Merid ian P sage.
	h m s	s	° ′ ″	″	h
1	20 48 13.62	+12.866	−19 0 10.7	+46.56	0 4.
2	20 53 21.79	12.815	18 41 16.9	47.91	0 6.
3	20 58 28.73	12.764	18 21 50.9	49.24	0 7.
4	21 3 34.43	12.712	18 1 53.5	50.54	0 8.
5	21 8 38.89	12.660	17 41 25.3	51.80	0 9.
6	21 13 42.10	+12.608	−17 20 27.1	+53.03	0 10.
7	21 18 44.06	12.556	16 58 59.6	54.24	0 11.
8	21 23 44.79	12.504	16 37 3.5	55.42	0 12.
9	21 28 44.28	12.453	16 14 39.6	56.57	0 13.
10	21 33 42.55	12.402	15 51 48.6	57.68	0 14.
11	21 38 39.60	+12.352	−15 28 31.2	+58.76	0 15.
12	21 43 35.46	12.303	15 4 48.3	59.81	0 16.
13	21 48 30.13	12.254	14 40 40.5	60.83	0 17.
14	21 53 23.64	12.206	14 16 8.6	61.82	0 18.
15	21 58 16.01	12.158	13 51 13.3	62.78	0 19.7
16	22 3 7.25	+12.112	−13 25 55.3	+63.71	0 20.6
17	22 7 57.38	12.066	13 0 15.5	64.60	0 21.5
18	22 12 46.44	12.022	12 34 14.7	65.46	0 22.4
19	22 17 34.44	11.978	12 7 53.6	66.29	0 23.2
20	22 22 21.40	11.935	11 41 12.9	67.08	0 24.0
21	22 27 7.35	+11.894	−11 14 13.5	+67.85	0 24.9
22	22 31 52.33	11.854	10 46 56.1	68.59	0 25.7
23	22 36 36.35	11.815	10 19 21.5	69.29	0 26.5
24	22 41 19.45	11.777	9 51 30.5	69.96	0 27.3
25	22 46 1.65	11.740	9 23 23.9	70.59	0 28.0
26	22 50 43.00	+11.705	− 8 55 2.4	+71.19	0 28.7
27	22 55 23.52	11.672	8 26 26.9	71.76	0 29.5
28	23 0 3.24	11.639	7 57 38.0	72.30	0 30.2
29	23 4 42.20	11.608	7 28 36.6	72.81	0 30.9
30	23 9 20.44	11.579	6 59 23.4	73.28	0 31.6
31	23 13 57.98	+11.551	− 6 29 59.3	+73.72	0 32.3
32	23 18 34.87	+11.524	− 6 0 24.9	+74.13	0 33.0

Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″
Semidiameter	4.99	4.99	4.98	4.99	4.99
Horizontal Parallax . . .	5.14	5.13	5.13	5.13	5.14

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	23 4 42.20	+11.608	−7 28 36.6	+72.81	0 30.9	1	1 26 12.95	+11.497	+ 8 7 14.1	+73.24	0 50.2
2	23 9 20.44	11.579	6 59 23.4	73.28	0 31.6	2	1 30 49.16	11.521	8 36 26.2	72.76	0 50.9
3	23 13 57.98	11.551	6 29 59.3	73.72	0 32.3	3	1 35 25.96	11.546	9 5 26.5	72.25	0 51.6
4	23 18 34.87	11.524	6 0 24.9	74.13	0 33.0	4	1 40 3.37	11.572	9 34 14.1	71.71	0 52.2
5	23 23 11.15	11.499	5 30 41.1	74.51	0 33.6	5	1 44 41.43	11.600	10 2 48.3	71.13	0 52.9
6	23 27 46.85	+11.476	−5 0 48.5	+74.86	0 34.2	6	1 49 20.17	+11.629	+10 31 8.5	+70.53	0 53.6
7	23 32 22.02	11.455	4 30 47.9	75.18	0 34.9	7	1 53 59.63	11.660	10 59 13.9	69.90	0 54.3
8	23 36 56.69	11.435	4 0 40.1	75.46	0 35.6	8	1 58 39.84	11.692	11 27 3.7	69.24	0 55.1
9	23 41 30.91	11.417	3 30 25.8	75.71	0 36.2	9	2 3 20.84	11.725	11 54 37.1	68.54	0 55.9
10	23 46 4.72	11.401	3 0 5.7	75.94	0 36.8	10	2 8 2.65	11.760	12 21 53.5	67.81	0 56.6
11	23 50 38.16	+11.387	−2 29 40.6	+76.14	0 37.4	11	2 12 45.31	+11.796	+12 48 52.1	+67.06	0 57.3
12	23 55 11.28	11.374	1 59 11.1	76.31	0 38.0	12	2 17 28.85	11.833	13 15 32.2	66.27	0 58.1
13	23 59 44.12	11.363	1 28 37.9	76.44	0 38.6	13	2 22 13.30	11.871	13 41 53.0	65.45	0 58.9
14	0 4 16.73	11.355	0 58 1.9	76.54	0 39.2	14	2 26 58.69	11.911	14 7 53.9	64.61	0 59.7
15	0 8 49.15	11.348	−0 27 23.7	76.62	0 39.9	15	2 31 45.04	11.952	14 33 34.1	63.73	1 0.5
16	0 13 21.43	+11.343	+0 3 16.0	+76.67	0 40.5	16	2 36 32.38	+11.994	+14 58 52.8	+62.82	1 1.4
17	0 17 53.61	11.340	0 33 56.5	76.69	0 41.1	17	2 41 20.73	12.036	15 23 49.3	61.88	1 2.3
18	0 22 25.73	11.338	1 4 37.0	76.67	0 41.7	18	2 46 10.11	12.079	15 48 22.9	60.91	1 3.2
19	0 26 57.84	11.338	1 35 16.8	76.63	0 42.2	19	2 51 0.54	12.123	16 12 32.8	59.90	1 4.1
20	0 31 29.98	11.340	2 5 55.2	76.56	0 42.8	20	2 55 52.03	12.168	16 36 18.2	58.86	1 5.0
21	0 36 2.19	+11.344	+2 36 31.4	+76.45	0 43.4	21	3 0 44.59	+12.213	+16 59 38.3	+57.80	1 5.9
22	0 40 34.52	11.350	3 7 4.7	76.31	0 44.0	22	3 5 38.24	12.258	17 22 32.4	56.70	1 6.9
23	0 45 7.00	11.357	3 37 34.4	76.15	0 44.6	23	3 10 32.99	12.303	17 44 59.9	55.57	1 7.9
24	0 49 39.68	11.366	4 7 59.7	75.95	0 45.2	24	3 15 28.83	12.349	18 6 59.9	54.41	1 8.8
25	0 54 12.59	11.377	4 38 19.8	75.72	0 45.8	25	3 20 25.77	12.396	18 28 31.8	53.23	1 9.8
26	0 58 45.78	+11.389	+5 8 34.0	+75.46	0 46.4	26	3 25 23.82	+12.442	+18 49 34.7	+52.01	1 10.9
27	1 3 19.29	11.403	5 38 41.6	75.16	0 47.0	27	3 30 22.97	12.487	19 10 8.0	50.76	1 12.0
28	1 7 53.16	11.419	6 8 41.9	74.84	0 47.6	28	3 35 23.22	12.533	19 30 11.0	49.48	1 13.0
29	1 12 27.43	11.436	6 38 34.0	74.49	0 48.3	29	3 40 24.57	12.578	19 49 42.9	48.17	1 14.1
30	1 17 2.12	11.455	7 8 17.2	74.11	0 49.0	30	3 45 27.00	12.623	20 8 43.1	46.83	1 15.2
31	1 21 37.28	+11.475	+7 37 50.8	+73.69	0 49.6	31	3 50 30.49	+12.667	+20 27 10.9	+45.47	1 16.3
32	1 26 12.95	+11.497	+8 7 14.1	+73.24	0 50.2	32	3 55 35.04	+12.711	+20 45 5.5	+44.07	1 17.4

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . . .	5.00	5.01	5.02	5.04	5.06	5.09	Semidiameter . . .	5.12	5.15	5.19	5.23	5.28	5.34
Horizontal Parallax	5.15	5.16	5.17	5.19	5.21	5.24	Horizontal Parallax	5.27	5.30	5.34	5.39	5.44	5.49

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations decreasing; the sign − indicates that south declinations are increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 50 30.49	+12.667	+20 27 10.9	+45.47	1 16.3
2	3 55 35.04	12.711	20 45 5.5	44.07	1 17.4
3	4 0 40.64	12.754	21 2 26.4	42.65	1 18.5
4	4 5 47.25	12.796	21 19 13.0	41.21	1 19.7
5	4 10 54.86	12.837	21 35 24.6	39.74	1 20.9
6	4 16 3.44	+12.878	+21 51 0.5	+38.25	1 22.1
7	4 21 12.98	12.917	22 6 0.3	36.73	1 23.3
8	4 26 23.44	12.955	22 20 23.3	35.19	1 24.6
9	4 31 34.80	12.992	22 34 9.1	33.62	1 25.9
10	4 36 47.02	13.027	22 47 17.1	32.03	1 27.1
11	4 42 0.08	+13.061	+22 59 46.7	+30.43	1 28.4
12	4 47 13.93	13.093	23 11 37.5	28.80	1 29.7
13	4 52 28.54	13.124	23 22 49.0	27.15	1 31.0
14	4 57 43.87	13.153	23 33 20.8	25.40	1 32.3
15	5 2 59.89	13.181	23 43 12.5	23.81	1 33.6
16	5 8 16.53	+13.206	+23 52 23.6	+22.11	1 34.9
17	5 13 33.75	13.229	24 0 53.7	20.39	1 36.2
18	5 18 51.50	13.250	24 8 42.5	18.66	1 37.6
19	5 24 9.73	13.269	24 15 49.6	16.92	1 39.0
20	5 29 28.38	13.285	24 22 14.8	15.17	1 40.4
21	5 34 47.40	+13.299	+24 27 57.9	+13.41	1 41.8
22	5 40 6.72	13.310	24 32 58.5	11.64	1 43.1
23	5 45 26.29	13.319	24 37 16.4	9.86	1 44.5
24	5 50 46.04	13.325	24 40 51.5	8.07	1 45.9
25	5 56 5.91	13.329	24 43 43.6	6.28	1 47.3
26	6 1 25.84	+13.330	+24 45 52.7	+ 4.48	1 48.7
27	6 6 45.75	13.328	24 47 18.6	2.68	1 50.1
28	6 12 5.58	13.323	24 48 1.2	+ 0.87	1 51.5
29	6 17 25.26	13.316	24 48 0.6	− 0.93	1 52.9
30	6 22 44.74	13.306	24 47 16.8	2.73	1 54.2
31	6 28 3.94	+13.293	+24 45 49.9	− 4.52	1 55.6
32	6 33 22.79	+13.277	+24 43 39.9	− 6.31	1 57.0

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	5.40	5.46	5.53	5.61	5.70	5.79	5.89
Horizontal Parallax	5.55	5.62	5.70	5.78	5.87	5.96	6.07

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Merid- ian Pa sage.
	h m s	s	° ′ ″	″	h
1	6 33 22.79	+13.277	+24 43 39.9	− 6.31	1 57
2	6 38 41.22	13.258	24 40 47.0	8.09	1 58
3	6 43 59.18	13.237	24 37 11.4	9.87	1 59
4	6 49 16.61	13.214	24 32 53.2	11.64	2 1
5	6 54 33.44	13.188	24 27 52.6	13.40	2 2
6	6 59 49.61	+13.159	+24 22 9.9	−15.15	2 3
7	7 5 5.07	13.128	24 15 45.4	16.89	2 5
8	7 10 19.76	13.095	24 8 39.4	18.61	2 6
9	7 15 33.63	13.060	24 0 52.2	20.32	2 7
10	7 20 46.64	13.023	23 52 24.1	22.01	2 8
11	7 25 58.72	+12.984	+23 43 15.5	−23.69	2 10
12	7 31 9.84	12.943	23 33 26.8	25.36	2 11
13	7 36 19.95	12.900	23 22 58.5	27.00	2 12
14	7 41 29.02	12.855	23 11 50.9	28.62	2 13
15	7 46 36.99	12.809	23 0 4.5	30.23	2 15
16	7 51 43.83	+12.761	+22 47 39.8	−31.82	2 16
17	7 56 49.50	12.711	22 34 37.3	33.38	2 17
18	8 1 53.96	12.660	22 20 57.6	34.92	2 18
19	8 6 57.19	12.608	22 6 41.2	36.44	2 19
20	8 11 59.15	12.555	21 51 48.6	37.93	2 20
21	8 16 59.81	+12.500	+21 36 20.5	−39.40	2 21
22	8 21 59.14	12.444	21 20 17.5	40.84	2 22
23	8 26 57.12	12.387	21 3 40.1	42.26	2 23
24	8 31 53.73	12.329	20 46 29.0	43.65	2 24
25	8 36 48.94	12.271	20 28 44.8	45.02	2 25
26	8 41 42.74	+12.212	+20 10 28.3	−46.36	2 26
27	8 46 35.11	12.152	19 51 40.1	47.66	2 27
28	8 51 26.04	12.092	19 32 20.9	48.93	2 28
29	8 56 15.51	12.031	19 12 31.3	50.18	2 29
30	9 1 3.51	11.970	18 52 12.1	51.40	2 30
31	9 5 50.04	+11.908	+18 31 24.0	−52.59	2 31
32	9 10 35.09	+11.846	+18 10 7.8	−53.75	2 31

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . . .	6.01	6.13	6.26	6.40	6.55	6
Horizontal Parallax	6.18	6.31	6.44	6.59	6.75	6

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	9 5 50.04	+11.908	+18 31 24.0	−52.59	2 31.1	1	11 22 42.60	+10.307	+ 4 51 45.7	−74.95	2 45.7
2	9 10 35.09	11.846	18 10 7.8	53.75	2 31.9	2	11 26 49.54	10.271	4 21 43.6	75.21	2 45.9
3	9 15 18.67	11.784	17 48 24.2	54.88	2 32.7	3	11 30 55.63	10.236	3 51 35.6	75.44	2 46.1
4	9 20 0.77	11.723	17 26 13.8	55.98	2 33.5	4	11 35 0.89	10.202	3 21 22.3	75.65	2 46.2
5	9 24 41.40	11.660	17 3 37.4	57.05	2 34.2	5	11 39 5.36	10.170	2 51 4.4	75.83	2 46.3
6	9 29 20.56	+11.601	+16 40 35.6	−58.09	2 34.9	6	11 43 9.07	+10.139	+ 2 20 42.4	−75.99	2 46.4
7	9 33 58.27	11.541	16 17 9.2	59.10	2 35.6	7	11 47 12.04	10.109	1 50 17.0	76.12	2 46.5
8	9 38 34.53	11.481	15 53 18.8	60.08	2 36.3	8	11 51 14.30	10.080	1 19 48.8	76.22	2 46.6
9	9 43 9.36	11.421	15 29 5.2	61.04	2 36.9	9	11 55 15.89	10.053	0 49 18.5	76.30	2 46.7
10	9 47 42.77	11.363	15 4 29.2	61.96	2 37.5	10	11 59 16.84	10.027	+ 0 18 46.5	76.36	2 46.8
11	9 52 14.78	+11.305	+14 39 31.4	−62.85	2 38.1	11	12 3 17.18	+10.002	− 0 11 46.5	−76.39	2 46.9
12	9 56 45.42	11.248	14 14 12.4	63.72	2 38.7	12	12 7 16.93	9.978	0 42 19.9	76.39	2 46.9
13	10 1 14.70	11.190	13 48 32.9	64.56	2 39.2	13	12 11 16.12	9.955	1 12 53.1	76.37	2 47.0
14	10 5 42.64	11.137	13 22 33.7	65.36	2 39.7	14	12 15 14.78	9.933	1 43 25.5	76.32	2 47.0
15	10 10 9.25	11.082	12 56 15.5	66.14	2 40.2	15	12 19 12.93	9.912	2 13 56.5	76.25	2 47.0
16	10 14 34.57	+11.028	+12 29 38.9	−66.89	2 40.7	16	12 23 10.60	+ 9.893	− 2 44 25.4	−76.15	2 47.0
17	10 18 58.61	10.975	12 2 44.7	67.61	2 41.2	17	12 27 7.81	9.875	3 14 51.7	76.03	2 47.0
18	10 23 21.40	10.923	11 35 33.5	68.30	2 41.6	18	12 31 4.59	9.857	3 45 14.8	75.88	2 47.0
19	10 27 42.96	10.873	11 8 6.0	68.97	2 42.0	19	12 35 0.96	9.840	4 15 34.1	75.71	2 47.0
20	10 32 3.32	10.824	10 40 22.9	69.61	2 42.4	20	12 38 56.94	9.824	4 45 49.0	75.51	2 47.0
21	10 36 22.50	+10.775	+10 12 25.0	−70.22	2 42.8	21	12 42 52.54	+ 9.809	− 5 15 58.8	−75.29	2 47.0
22	10 40 40.53	10.727	9 44 12.9	70.79	2 43.2	22	12 46 47.78	9.794	5 46 3.0	75.04	2 47.0
23	10 44 57.42	10.681	9 15 47.3	71.33	2 43.5	23	12 50 42.68	9.780	6 16 0.8	74.76	2 47.0
24	10 49 13.21	10.635	8 47 9.0	71.85	2 43.8	24	12 54 37.25	9.766	6 45 51.6	74.46	2 46.9
25	10 53 27.91	10.590	8 18 18.5	72.34	2 44.1	25	12 58 31.49	9.753	7 15 34.9	74.13	2 46.9
26	10 57 41.56	+10.547	+ 7 49 16.6	−72.80	2 44.4	26	13 2 25.41	+ 9.740	− 7 45 10.0	−73.77	2 46.8
27	11 1 54.18	10.505	7 20 4.1	73.23	2 44.6	27	13 6 19.02	9.727	8 14 36.2	73.39	2 46.8
28	11 6 5.79	10.463	6 50 41.6	73.63	2 44.8	28	13 10 12.32	9.714	8 43 52.9	72.98	2 46.7
29	11 10 16.41	10.422	6 21 9.8	74.00	2 45.1	29	13 14 5.31	9.702	9 12 59.4	72.55	2 46.7
30	11 14 26.06	10.382	5 51 29.5	74.34	2 45.3	30	13 17 58.01	9.690	9 41 55.2	72.09	2 46.6
31	11 18 34.78	+10.344	+ 5 21 41.2	−74.66	2 45.5	31	13 21 50.41	+ 9.678	−10 10 39.6	−71.60	2 46.6
32	11 22 42.60	+10.307	+ 4 51 45.7	−74.95	2 45.7	32	13 25 42.51	+ 9.665	−10 39 12.1	−71.09	2 46.5

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . . .	6.90	7.10	7.31	7.54	7.79	8.06	Semidiameter . . .	8.36	8.68	9.03	9.41	9.83	10.30
Horizontal Parallax	7.11	7.31	7.53	7.76	8.02	8.30	Horizontal Parallax	8.60	8.93	9.29	9.69	10.13	10.60

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Me ian sa
	h m s	s	° ′ ″	″	h m		h m s	. s	° ′ ″	″	h
1	13 25 42.51	+9.665	−10 39 12.1	−71.09	2 46.5	1	15 18 2.36	+8.756	−22 37 17.0	−45.27	2 4
2	13 29 34.32	9.652	11 7 32.1	70.56	2 46.4	2	15 21 31.57	8.678	23 55 9.4	44.09	2 4
3	13 33 25.83	9.640	11 35 39.0	70.00	2 46.3	3	15 24 58.84	8.594	23 12 33.2	42.89	2 3
4	13 37 17.03	9.627	12 3 32.2	69.42	2 46.2	4	15 28 24.03	8.504	23 29 28.1	41.67	2 3
5	13 41 7.92	9.614	12 31 11.2	68.82	2 46.1	5	15 31 47.01	8.409	23 45 53.6	40.44	2 3
6	13 44 58.50	+9.601	−12 58 35.5	−68.19	2 46.0	6	15 35 7.62	+8.308	−24 1 49.4	−39.20	2 3
7	13 48 48.77	9.588	13 25 44.4	67.54	2 45.9	7	15 38 25.73	8.200	24 17 15.3	37.94	2 3
8	13 52 38.71	9.574	13 52 37.4	66.87	2 45.8	8	15 41 41.17	8.085	24 32 10.8	36.67	2 3
9	13 56 28.32	9.560	14 19 14.0	66.17	2 45.7	9	15 44 53.78	7.964	24 46 35.6	35.39	2 3
10	14 0 17.57	9.545	14 45 33.7	65.45	2 45.6	10	15 48 3.39	7.835	25 0 29.4	34.09	2 3
11	14 4 6.45	+9.529	−15 11 35.8	−64.71	2 45.5	11	15 51 9.81	+7.698	−25 13 51.9	−32.78	2 34
12	14 7 54.94	9.512	15 37 19.9	63.95	2 45.4	12	15 54 12.86	7.554	25 26 42.8	31.45	2 33
13	14 11 43.01	9.494	16 2 45.4	63.16	2 45.2	13	15 57 12.34	7.401	25 39 1.6	30.11	2 32
14	14 15 30.64	9.475	16 27 51.7	62.35	2 45.0	14	16 0 8.05	7.240	25 50 48.1	28.76	2 31
15	14 19 17.80	9.454	16 52 38.3	61.52	2 44.9	15	16 2 59.78	7.070	26 2 2.0	27.39	2 30
16	14 23 4.44	+9.432	−17 17 4.8	−60.67	2 44.7	16	16 5 47.31	+6.890	−26 12 42.9	−26.01	2 29.
17	14 26 50.54	9.408	17 41 10.6	59.80	2 44.5	17	16 8 30.39	6.700	26 22 50.4	24.61	2 27.
18	14 30 36.04	9.383	18 4 55.2	58.90	2 44.3	18	16 11 8.78	6.499	26 32 24.1	23.19	2 26.
19	14 34 20.91	9.355	18 28 17.9	57.98	2 44.1	19	16 13 42.23	6.287	26 41 23.7	21.76	2 25.
20	14 38 5.07	9.324	18 51 18.2	57.04	2 43.9	20	16 16 10.47	6.064	26 49 48.8	20.31	2 23.
21	14 41 48.47	+9.291	−19 13 55.7	−56.07	2 43.7	21	16 18 33.20	+5.829	−26 57 38.8	−18.84	2 22.
22	14 45 31.03	9.255	19 36 9.7	55.08	2 43.5	22	16 20 50.14	5.581	27 4 53.2	17.35	2 20.
23	14 49 12.68	9.216	19 57 59.8	54.08	2 43.2	23	16 23 1.00	5.321	27 11 31.6	15.84	2 18.
24	14 52 53.35	9.173	20 19 25.4	53.05	2 42.9	24	16 25 5.46	5.048	27 17 33.4	14.30	2 16.
25	14 56 32.94	9.126	20 40 26.0	51.99	2 42.7	25	16 27 3.21	4.762	27 22 57.9	12.73	2 14.
26	15 0 11.35	+9.075	−21 1 1.0	−50.92	2 42.4	26	16 28 53.94	+4.463	−27 27 44.4	−11.13	2 12.
27	15 3 48.50	9.020	21 21 10.0	49.83	2 42.0	27	16 30 37.34	4.151	27 31 52.4	9.51	2 10.
28	15 7 24.28	8.961	21 40 52.6	48.71	2 41.6	28	16 32 13.09	3.826	27 35 21.1	7.86	2 8.
29	15 10 58.59	8.897	22 0 8.2	47.58	2 41.3	29	16 33 40.89	3.488	27 38 9.7	6.18	2 5.
30	15 14 31.32	8.829	22 18 56.4	46.43	2 40.9	30	16 35 0.43	3.138	27 40 17.2	4.45	2 2.
31	15 18 2.36	+8.756	−22 37 17.0	−45.27	2 40.5	31	16 36 11.41	+2.775	−27 41 42.7	− 2.68	2 0.
32	15 21 31.57	+8.678	−22 55 9.4	−44.09	2 40.0	32	16 37 13.54	+2.400	−27 42 25.3	− 0.87	1 57.3

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter	10.81	11.37	12.00	12.70	13.48	14.35	Semidiameter . . .	15.34	16.45	17.71	19.13	20.73	22.52
Horizontal Parallax	11.13	11.71	12.35	13.07	13.87	14.78	Horizontal Parallax	15.79	16.94	18.24	19.70	21.35	23.18

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	16 37 13.54	+2.400	−27 42 25.3	− 0.87	1 57.3
2	16 38 6.54	2.015	27 42 23.9	+ 0.99	1 54.2
3	16 38 50.16	1.619	27 41 37.2	2.90	1 51.0
4	16 39 24.15	1.213	27 40 4.1	4.86	1 47.6
5	16 39 48.29	0.798	27 37 43.3	6.88	1 44.0
6	16 40 2.39	+0.376	−27 34 33.4	+ 8.95	1 40.3
7	16 40 6.30	−0.051	27 30 33.0	11.08	1 36.4
8	16 39 59.90	0.482	27 25 40.8	13.27	1 32.4
9	16 39 43.12	0.916	27 19 55.3	15.52	1 28.2
10	16 39 15.93	1.349	27 13 15.2	17.82	1 23.8
11	16 38 38.37	−1.780	−27 5 39.2	+20.18	1 19.2
12	16 37 50.52	2.206	26 57 6.1	22.58	1 14.5
13	16 36 52.53	2.624	26 47 34.7	25.03	1 9.6
14	16 35 44.62	3.032	26 37 4.3	27.51	1 4.5
15	16 34 27.08	3.427	26 25 34.3	30.00	0 59.3
16	16 33 0.26	−3.805	−26 13 4.4	+32.49	0 53.9
17	16 31 24.60	4.164	25 59 34.6	34.98	0 48.4
18	16 29 40.60	4.499	25 45 5.4	37.44	0 42.8
19	16 27 48.86	4.808	25 29 37.9	39.85	0 37.0
20	16 25 50.05	5.088	25 13 13.5	42.18	0 31.1
21	16 23 44.93	−5.334	−24 55 54.3	+44.41	0 25.1
22	16 21 34.32	5.544	24 37 43.1	46.51	0 19.0
23	16 19 19.10	5.717	24 18 43.3	48.45	0 12.8
24	16 17 0.22	5.849	23 58 59.0	50.20	0 6.6
25	16 14 38.70	5.937	23 38 35.1	51.75	0 0.3 23 54.0
26	16 12 15.57	−5.982	−23 17 36.8	+53.07	23 47.7
27	16 9 51.87	5.984	22 56 9.9	54.13	23 41.4
28	16 7 28.67	5.942	22 34 21.0	54.91	23 35.1
29	16 5 7.02	5.856	22 12 16.8	55.40	23 28.9
30	16 2 47.93	5.728	21 50 4.3	55.59	23 22.7
31	16 0 32.39	−5.560	−21 27 50.8	+55.48	23 16.6
32	15 58 21.34	−5.355	−21 5 43.4	+55.08	23 10.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . . .	24.47	26.52	28.55	30.35	31.65	32.20
Horizontal Parallax	25.19	27.31	29.40	31.25	32.59	33.16

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	16 0 32.39	−5.560	−21 27 50.8	+55.48	23 16.6
2	15 58 21.34	5.355	21 5 43.4	55.08	23 10.6
3	15 56 15.65	5.114	20 43 49.4	54.38	23 4.7
4	15 54 16.12	4.842	20 22 15.6	53.39	22 58.9
5	15 52 23.47	4.541	20 1 8.6	52.14	22 53.2
6	15 50 38.35	−4.215	−19 40 34.7	+50.64	22 47.7
7	15 49 1.31	3.868	19 20 39.7	48.91	22 42.3
8	15 47 32.84	3.502	19 1 28.6	46.98	22 37.0
9	15 46 13.34	3.121	18 43 6.0	44.88	22 31.9
10	15 45 3.12	2.729	18 25 35.9	42.62	22 26.9
11	15 44 2.40	−2.330	−18 9 1.6	+40.23	22 22.1
12	15 43 11.35	1.925	17 53 25.8	37.74	22 17.5
13	15 42 30.06	1.517	17 38 50.6	35.18	22 13.0
14	15 41 58.58	1.108	17 25 17.5	32.57	22 8.7
15	15 41 36.88	0.701	17 12 47.5	29.93	22 4.6
16	15 41 24.89	−0.298	−17 1 21.0	+27.28	22 0.6
17	15 41 22.51	+0.099	16 50 58.2	24.63	21 56.8
18	15 41 29.61	0.491	16 41 38.5	22.01	21 53.1
19	15 41 46.03	0.876	16 33 21.3	19.43	21 49.6
20	15 42 11.59	1.253	16 26 5.6	16.89	21 46.2
21	15 42 46.11	+1.622	−16 19 50.2	+14.41	21 43.0
22	15 43 29.38	1.983	16 14 33.5	11.99	21 40.0
23	15 44 21.21	2.335	16 10 14.0	9.65	21 37.0
24	15 45 21.38	2.678	16 6 49.8	7.39	21 34.2
25	15 46 29.67	3.012	16 4 18.8	5.21	21 31.5
26	15 47 45.85	+3.336	−16 2 39.0	+ 3.12	21 29.0
27	15 49 9.69	3.651	16 1 48.3	+ 1.12	21 26.5
28	15 50 40.98	3.956	16 1 44.3	− 0.78	21 24.2
29	15 52 19.49	4.252	16 2 24.7	2.58	21 22.0
30	15 54 5.02	4.540	16 3 47.2	4.28	21 19.9
31	15 55 57.35	+4.819	−16 5 49.6	− 5.89	21 18.0
32	15 57 56.26	+5.089	−16 8 29.3	− 7.40	21 16.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter . . .	31.86	30.70	28.97	26.97	24.91	22.94	21.11
Horizontal Parallax	32.80	31.61	29.83	27.77	25.65	23.62	21.74

Note.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; the sign − indicates that south declinations are increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 12 52.05	−4.348	+26 16 7.7	+11.19	12 28.7
2	7 11 7.35	4.373	26 20 31.8	10.81	12 23.0
3	7 9 22.13	4.390	26 24 46.4	10.40	12 17.3
4	7 7 36.62	4.398	26 28 51.0	9.96	12 11.6
5	7 5 51.03	4.397	26 32 45.2	9.52	12 6.0
6	7 4 5.60	−4.386	+26 36 28.5	+ 9.06	12 0.3
7	7 2 20.54	4.367	26 40 0.7	8.60	11 54.7
8	7 0 36.06	4.339	26 43 21.3	8.12	11 49.0
9	6 58 52.38	4.302	26 46 30.3	7.63	11 43.4
10	6 57 9.71	4.256	26 49 27.4	7.13	11 37.8
11	6 55 28.25	−4.200	+26 52 12.6	+ 6.63	11 32.2
12	6 53 48.19	4.137	26 54 45.9	6.13	11 26.6
13	6 52 9.72	4.067	26 57 7.2	5.64	11 21.1
14	6 50 33.02	3.989	26 59 16.6	5.15	11 15.6
15	6 48 58.26	3.905	27 1 14.4	4.66	11 10.1
16	6 47 25.61	−3.814	+27 3 0.6	+ 4.19	11 4.6
17	6 45 55.23	3.716	27 4 35.5	3.72	10 59.2
18	6 44 27.27	3.612	27 5 59.2	3.26	10 53.8
19	6 43 1.88	3.502	27 7 12.1	2.81	10 48.5
20	6 41 39.20	3.386	27 8 14.4	2.38	10 43.2
21	6 40 19.36	−3.265	+27 9 6.4	+ 1.96	10 38.0
22	6 39 2.49	3.139	27 9 48.5	1.56	10 32.8
23	6 37 48.70	3.008	27 10 21.0	1.16	10 27.7
24	6 36 38.10	2.874	27 10 44.3	0.79	10 22.6
25	6 35 30.77	2.736	27 10 58.7	0.42	10 17.6
26	6 34 26.79	−2.595	+27 11 4.7	+ 0.08	10 12.6
27	6 33 26.23	2.451	27 11 2.5	− 0.25	10 7.7
28	6 32 29.17	2.304	27 10 52.7	0.56	10 2.8
29	6 31 35.65	2.156	27 10 35.6	0.86	9 58.0
30	6 30 45.71	2.006	27 10 11.6	1.13	9 53.3
31	6 29 59.39	−1.854	+27 9 41.2	− 1.39	9 48.6
32	6 29 16.70	−1.702	+27 9 4.7	− 1.64	9 44.0

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Me ian sa
	h m s	s	° ′ ″	″	h
1	6 29 16.70	−1.702	+27 9 4.7	−1.64	9
2	6 28 37.65	1.550	27 8 22.4	1.88	9
3	6 28 2.25	1.398	27 7 34.6	2.10	9 3
4	6 27 30.49	1.247	27 6 41.5	2.31	9 3
5	6 27 2.35	1.097	27 5 43.6	2.50	9 2
6	6 26 37.80	−0.947	+27 4 41.1	−2.69	9 2
7	6 26 16.85	0.798	27 3 34.4	2.86	9 1
8	6 25 59.46	0.651	27 2 23.8	3.02	9 1
9	6 25 45.58	0.505	27 1 9.3	3.17	9
10	6 25 35.18	0.361	26 59 51.7	3.31	9
11	6 25 28.22	−0.219	+26 58 30.6	−3.44	9
12	6 25 24.66	−0.078	26 57 6.5	3.56	8 5
13	6 25 24.45	+0.060	26 55 39.4	3.68	8 5
14	6 25 27.54	0.197	26 54 9.4	3.80	8 4
15	6 25 33.88	0.332	26 52 36.6	3.91	8 4
16	6 25 43.43	+0.465	+26 51 1.3	−4.02	8 41
17	6 25 56.14	0.596	26 49 23.6	4.12	8 38
18	6 26 11.98	0.725	26 47 43.5	4.22	8 34
19	6 26 30.90	0.852	26 46 1.1	4.32	8 30
20	6 26 52.85	0.978	26 44 16.4	4.41	8 27
21	6 27 17.78	+1.101	+26 42 29.3	−4.51	8 23
22	6 27 45.65	1.222	26 40 40.0	4.61	8 20
23	6 28 16.39	1.341	26 38 48.4	4.71	8 17
24	6 28 49.96	1.457	26 36 54.6	4.80	8 13
25	6 29 26.30	1.572	26 34 58.4	4.90	8 10
26	6 30 5.36	+1.684	+26 32 59.9	−4.99	8 7
27	6 30 47.08	1.794	26 30 59.0	5.09	8 3
28	6 31 31.40	1.901	26 28 55.8	5.19	8 0
29	6 32 18.27	2.006	26 26 50.1	5.29	7 57
30	6 33 7.64	2.109	26 24 41.9	5.40	7 54
31	6 33 59.44	+2.209	+26 22 31.1	−5.51	7 51
32	6 34 53.61	+2.307	+26 20 17.6	−5.60	7 48

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	8.11	8.09	7.97	7.80	7.58	7.32	7.03
Horizontal Parallax . .	14.14	14.06	13.87	13.57	13.19	12.74	12.23

Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″
Semidiameter	6.73	6.43	6.13	5.84	5.57
Horizontal Parallax . . .	11.71	11.19	10.67	10.16	9.69

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 32 18.27	+2.006	+26 26 50.1	− 5.29	7 57.4	1	7 12 45.90	+4.231	+24 54 6.2	−10.32	6 36.1
2	6 33 7.64	2.109	26 24 41.9	5.40	7 54.4	2	7 14 27.97	4.277	24 49 55.8	10.55	6 33.9
3	6 33 59.44	2.209	26 22 31.1	5.51	7 51.4	3	7 16 11.13	4.321	24 45 40.0	10.78	6 31.7
4	6 34 53.61	2.307	26 20 17.6	5.62	7 48.3	4	7 17 55.34	4.364	24 41 18.6	11.02	6 29.5
5	6 35 50.09	2.402	26 18 1.4	5.74	7 45.3	5	7 19 40.56	4.405	24 36 51.6	11.26	6 27.3
6	6 36 48.83	+2.494	+26 15 42.4	− 5.86	7 42.4	6	7 21 26.75	+4.445	+24 32 18.9	−11.50	6 25.1
7	6 37 49.77	2.585	26 13 20.5	5.98	7 39.5	7	7 23 13.90	4.484	24 27 40.5	11.74	6 23.0
8	6 38 52.85	2.673	26 10 55.7	6.10	7 36.6	8	7 25 1.95	4.522	24 22 56.3	11.97	6 20.8
9	6 39 58.02	2.759	26 8 27.9	6.23	7 33.7	9	7 26 50.89	4.558	24 18 6.3	12.21	6 18.7
10	6 41 5.22	2.842	26 5 56.9	6.36	7 30.9	10	7 28 40.68	4.592	24 13 10.3	12.46	6 16.6
11	6 42 14.39	+2.923	+26 3 22.7	− 6.50	7 28.1	11	7 30 31.30	+4.626	+24 8 8.4	−12.71	6 14.5
12	6 43 25.47	3.002	26 0 45.3	6.64	7 25.4	12	7 32 22.72	4.659	24 3 0.5	12.96	6 12.4
13	6 44 38.42	3.078	25 58 4.4	6.78	7 22.7	13	7 34 14.91	4.692	23 57 46.5	13.22	6 10.4
14	6 45 53.20	3.153	25 55 20.1	6.92	7 20.0	14	7 36 7.87	4.723	23 52 26.4	13.47	6 8.3
15	6 47 9.76	3.226	25 52 32.2	7.07	7 17.4	15	7 38 1.57	4.753	23 47 0.1	13.73	6 6.3
16	6 48 28.05	+3.298	+25 49 40.6	− 7.23	7 14.8	16	7 39 55.98	+4.783	+23 41 27.5	−13.99	6 4.3
17	6 49 48.04	3.368	25 46 45.2	7.39	7 12.2	17	7 41 51.10	4.812	23 35 48.6	14.26	6 2.3
18	6 51 9.68	3.436	25 43 45.9	7.56	7 9.6	18	7 43 46.91	4.840	23 30 3.4	14.52	6 0.3
19	6 52 32.94	3.503	25 40 42.6	7.73	7 7.0	19	7 45 43.39	4.867	23 24 11.7	14.79	5 58.3
20	6 53 57.78	3.568	25 37 35.2	7.90	7 4.5	20	7 47 40.51	4.894	23 18 13.5	15.06	5 56.3
21	6 55 24.17	+3.632	+25 34 23.6	− 8.08	7 2.0	21	7 49 38.26	+4.920	+23 12 8.8	−15.34	5 54.3
22	6 56 52.06	3.694	25 31 7.6	8.26	6 59.6	22	7 51 36.62	4.945	23 5 57.6	15.62	5 52.3
23	6 58 21.42	3.754	25 27 47.2	8.45	6 57.1	23	7 53 35.56	4.969	22 59 39.7	15.89	5 50.4
24	6 59 52.22	3.813	25 24 22.2	8.64	6 54.7	24	7 55 35.07	4.992	22 53 15.1	16.16	5 48.4
25	7 1 24.41	3.870	25 20 52.6	8.84	6 52.3	25	7 57 35.13	5.014	22 46 43.9	16.44	5 46.5
26	7 2 57.96	+3.925	+25 17 18.2	− 9.04	6 49.9	26	7 59 35.72	+5.036	+22 40 6.0	−16.72	5 44.6
27	7 4 32.84	3.979	25 13 38.9	9.24	6 47.5	27	8 1 36.84	5.057	22 33 21.4	17.00	5 42.6
28	7 6 9.01	4.032	25 9 54.7	9.45	6 45.1	28	8 3 38.47	5.078	22 26 30.0	17.28	5 40.7
29	7 7 46.43	4.084	25 6 5.4	9.66	6 42.8	29	8 5 40.58	5.098	22 19 31.9	17.57	5 38.8
30	7 9 25.08	4.135	25 2 10.9	9.88	6 40.6	30	8 7 43.16	5.117	22 12 26.9	17.85	5 36.9
31	7 11 4.92	+4.184	+24 58 11.2	−10.10	6 38.3	31	8 9 46.17	+5.135	+22 5 15.1	−18.13	5 35.0
32	7 12 45.90	+4.231	+24 54 6.2	−10.32	6 36.1	32	8 11 49.61	+5.152	+21 57 56.6	−18.41	5 33.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter	5.31	5.07	4.84	4.63	4.44	4.26	Semidiameter . . .	4.09	3.94	3.79	3.66	3.54	3.43
Horizontal Parallax	9.24	8.82	8.42	8.06	7.73	7.41	Horizontal Parallax	7.12	6.86	6.59	6.37	6.16	5.97

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

MARS, 1914.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	8 9 46.17	+5.135	+22 5 15.1	−18.13	5 35.0
2	8 11 49.61	5.152	21 57 56.6	18.41	5 33.1
3	8 13 53.45	5.169	21 50 31.4	18.70	5 31.3
4	8 15 57.68	5.185	21 42 59.4	18.98	5 29.4
5	8 18 2.28	5.200	21 35 20.6	19.26	5 27.6
6	8 20 7.23	+5.215	+21 27 35.1	−19.54	5 25.7
7	8 22 12.51	5.228	21 19 42.7	19.82	5 23.9
8	8 24 18.11	5.241	21 11 43.6	20.10	5 22.1
9	8 26 24.03	5.254	21 3 37.8	20.38	5 20.2
10	8 28 30.26	5.266	20 55 25.3	20.66	5 18.3
11	8 30 36.78	+5.278	+20 47 6.1	−20.94	5 16.5
12	8 32 43.57	5.289	20 38 40.2	21.22	5 14.7
13	8 34 50.62	5.300	20 30 7.5	21.50	5 12.9
14	8 36 57.94	5.310	20 21 28.1	21.78	5 11.1
15	8 39 5.52	5.320	20 12 42.0	22.06	5 9.2
16	8 41 13.34	+5.330	+20 3 49.2	−22.34	5 7.4
17	8 43 21.40	5.340	19 54 49.6	22.62	5 5.6
18	8 45 29.70	5.350	19 45 43.3	22.90	5 3.8
19	8 47 38.22	5.359	19 36 30.3	23.18	5 2.0
20	8 49 46.96	5.368	19 27 10.6	23.46	5 0.2
21	8 51 55.90	+5.377	+19 17 44.3	−23.74	4 58.4
22	8 54 5.05	5.386	19 8 11.3	24.02	4 56.6
23	8 56 14.40	5.394	18 58 31.7	24.29	4 54.9
24	8 58 23.93	5.401	18 48 45.5	24.57	4 53.1
25	9 0 33.64	5.408	18 38 52.6	24.84	4 51.3
26	9 2 43.51	+5.415	+18 28 53.2	−25.12	4 49.5
27	9 4 53.54	5.422	18 18 47.2	25.39	4 47.7
28	9 7 3.73	5.428	18 8 34.7	25.66	4 45.9
29	9 9 14.07	5.434	17 58 15.8	25.93	4 44.2
30	9 11 24.55	5.440	17 47 50.6	26.20	4 42.4
31	9 13 35.15	+5.445	+17 37 19.0	−26.46	4 40.7
32	9 15 45.87	+5.450	+17 26 41.2	−26.72	4 39.0

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Pa sage
	h m s	s	° ′ ″	″	h
1	9 15 45.87	+5.450	+17 26 41.2	−26.72	4 39
2	9 17 56.70	5.454	17 15 57.1	26.98	4 37
3	9 20 7.64	5.458	17 5 6.8	27.23	4 35
4	9 22 18.68	5.462	16 54 10.4	27.48	4 33
5	9 24 29.81	5.466	16 43 7.9	27.73	4 31
6	9 26 41.02	+5.469	+16 31 59.4	−27.98	4 30.
7	9 28 52.31	5.473	16 20 44.9	28.23	4 28.
8	9 31 3.69	5.476	16 9 24.5	28.48	4 26.
9	9 33 15.15	5.479	15 57 58.2	28.73	4 24.
10	9 35 26.68	5.482	15 46 26.1	28.97	4 23.
11	9 37 38.28	+5.485	+15 34 48.1	−29.21	4 21.
12	9 39 49.96	5.488	15 23 4.3	29.45	4 19.
13	9 42 1.71	5.492	15 11 14.8	29.69	4 17.
14	9 44 13.54	5.495	14 59 19.5	29.92	4 16.
15	9 46 25.45	5.498	14 47 18.6	30.16	4 14.
16	9 48 37.42	+5.501	+14 35 12.0	−30.39	4 12.
17	9 50 49.46	5.504	14 22 59.8	30.63	4 10.
18	9 53 1.57	5.507	14 10 42.1	30.86	4 9.
19	9 55 13.76	5.510	13 58 18.9	31.09	4 7.
20	9 57 26.01	5.512	13 45 50.2	31.31	4 5.
21	9 59 38.34	+5.515	+13 33 16.2	−31.54	4 4.
22	10 1 50.74	5.518	13 20 36.8	31.76	4 2.
23	10 4 3.20	5.521	13 7 52.1	31.98	4 0.
24	10 6 15.72	5.523	12 55 2.1	32.19	3 58.
25	10 8 28.31	5.526	12 42 6.9	32.40	3 57.
26	10 10 40.95	+5.529	+12 29 6.7	−32.61	3 55.
27	10 12 53.66	5.531	12 16 1.5	32.82	3 53.
28	10 15 6.43	5.533	12 2 51.4	33.02	3 51.
29	10 17 19.25	5.536	11 49 36.5	33.22	3 50.
30	10 19 32.12	5.538	11 36 16.8	33.42	3 48.
31	10 21 45.04	+5.540	+11 22 52.3	−33.62	3 46.
32	10 23 58.02	+5.542	+11 9 23.2	−33.81	3 45.

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	3.32	3.22	3.13	3.05	2.97	2.90	2.83
Horizontal Parallax	5.78	5.60	5.45	5.30	5.17	5.05	4.92

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . . .	2.77	2.71	2.66	2.61	2.56	2.5
Horizontal Parallax	4.82	4.73	4.63	4.54	4.45	4.38

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 21 45.04	+5.540	+11 22 52.3	−33.62	3 46.7	1	11 31 2.93	+5.658	+3 54 21.8	−38.25	2 53.8
2	10 23 58.02	5.542	11 9 23.2	33.81	3 45.0	2	11 33 18.79	5.664	3 39 2.6	38.35	2 52.1
3	10 26 11.05	5.544	10 55 49.6	34.00	3 43.2	3	11 35 34.79	5.670	3 23 41.2	38.44	2 50.5
4	10 28 24.13	5.546	10 42 11.5	34.18	3 41.5	4	11 37 50.93	5.676	3 8 17.6	38.53	2 48.8
5	10 30 37.26	5.549	10 28 29.0	34.36	3 39.8	5	11 40 7.22	5.683	2 52 51.8	38.62	2 47.2
6	10 32 50.44	+5.551	+10 14 42.2	−34.53	3 38.1	6	11 42 23.67	+5.690	+2 37 24.0	−38.70	2 45.5
7	10 35 3.68	5.554	10 0 51.1	34.71	3 36.3	7	11 44 40.29	5.697	2 21 54.3	38.78	2 43.8
8	10 37 16.98	5.556	9 46 55.8	34.88	3 34.6	8	11 46 57.08	5.704	2 6 22.7	38.86	2 42.1
9	10 39 30.34	5.559	9 32 56.2	35.06	3 32.9	9	11 49 14.05	5.711	1 50 49.3	38.93	2 40.5
10	10 41 43.76	5.561	9 18 52.6	35.23	3 31.2	10	11 51 31.20	5.719	1 35 14.1	39.00	2 38.8
11	10 43 57.25	+5.564	+ 9 4 44.9	−35.41	3 29.5	11	11 53 48.54	+5.727	+1 19 37.1	−39.07	2 37.2
12	10 46 10.82	5.567	8 50 33.2	35.58	3 27.8	12	11 56 6.08	5.735	1 3 58.5	39.14	2 35.5
13	10 48 24.46	5.570	8 36 17.5	35.74	3 26.1	13	11 58 23.81	5.744	0 48 18.5	39.20	2 33.9
14	10 50 38.19	5.574	8 21 58.0	35.90	3 24.4	14	12 0 41.75	5.753	0 32 37.1	39.26	2 32.2
15	10 52 52.00	5.577	8 7 34.7	36.06	3 22.6	15	12 2 59.91	5.762	0 16 54.3	39.31	2 30.6
16	10 55 5.90	+5.581	+ 7 53 7.5	−36.21	3 20.9	16	12 5 18.29	+5.771	+0 1 10.2	−39.36	2 29.0
17	10 57 19.89	5.585	7 38 36.6	36.36	3 19.2	17	12 7 36.90	5.781	−0 14 35.1	39.41	2 27.4
18	10 59 33.98	5.589	7 24 2.1	36.51	3 17.5	18	12 9 55.75	5.791	0 30 21.4	39.46	2 25.7
19	11 1 48.17	5.593	7 9 24.1	36.66	3 15.8	19	12 12 14.84	5.801	0 46 8.7	39.50	2 24.1
20	11 4 2.46	5.598	6 54 42.6	36.81	3 14.1	20	12 14 34.17	5.811	1 1 57.0	39.54	2 22.5
21	11 6 16.86	+5.602	+ 6 39 57.6	−36.95	3 12.4	21	12 16 53.76	+5.822	−1 17 46.1	−39.57	2 20.9
22	11 8 31.37	5.607	6 25 9.2	37.09	3 10.7	22	12 19 13.59	5.832	1 33 35.9	39.59	2 19.3
23	11 10 45.99	5.612	6 10 17.6	37.22	3 9.0	23	12 21 33.68	5.843	1 49 26.2	39.61	2 17.7
24	11 13 0.72	5.617	5 55 22.8	37.35	3 7.3	24	12 23 54.03	5.854	2 5 16.9	39.62	2 16.1
25	11 15 15.57	5.622	5 40 24.9	37.48	3 5.6	25	12 26 14.66	5.865	2 21 8.0	39.62	2 14.5
26	11 17 30.54	+5.627	+ 5 25 24.1	−37.60	3 3.9	26	12 28 35.56	+5.876	−2 36 59.3	−39.63	2 12.9
27	11 19 45.62	5.632	5 10 20.4	37.72	3 2.2	27	12 30 56.73	5.888	2 52 50.7	39.64	2 11.3
28	11 22 0.83	5.637	4 55 13.9	37.83	3 0.6	28	12 33 18.18	5.900	3 8 42.0	39.64	2 9.7
29	11 24 16.16	5.642	4 40 4.7	37.94	2 58.9	29	12 35 39.92	5.912	3 24 33.4	39.63	2 8.1
30	11 26 31.62	5.647	4 24 52.9	38.05	2 57.2	30	12 38 1.95	5.924	3 40 24.5	39.62	2 6.5
31	11 28 47.21	+5.652	+ 4 9 38.6	−38.15	2 55.5	31	12 40 24.27	+5.937	−3 56 15.3	−39.61	2 5.0
32	11 31 2.93	+5.658	+ 3 54 21.8	−38.25	2 53.8	32	12 42 46.90	+5.950	−4 12 5.7	−39.59	2 3.5

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter	2.48	2.44	2.40	2.37	2.34	2.31	Semidiameter . . .	2.28	2.26	2.24	2.22	2.19	2.17
Horizontal Parallax	4.32	4.25	4.18	4.12	4.07	4.02	Horizontal Parallax	3.97	3.93	3.90	3.86	3.82	3.78

NOTE.—The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	12 42 46.90	+5.950	− 4 12 5.7	−39.59	2 3.5
2	12 45 9.83	5.963	4 27 55.6	39.56	2 1.9
3	12 47 33.09	5.976	4 43 44.8	39.53	2 0.3
4	12 49 56.66	5.990	4 59 33.3	39.50	1 58.8
5	12 52 20.56	6.004	5 15 21.0	39.47	1 57.2
6	12 54 44.81	+6.018	− 5 31 7.8	−39.43	1 55.7
7	12 57 9.40	6.032	5 46 53.6	39.39	1 54.1
8	12 59 34.35	6.047	6 2 38.3	39.34	1 52.6
9	13 1 59.66	6.063	6 18 21.9	39.29	1 51.1
10	13 4 25.34	6.079	6 34 4.1	39.23	1 49.6
11	13 6 51.40	+6.095	− 6 49 44.8	−39.17	1 48.1
12	13 9 17.85	6.111	7 5 23.9	39.10	1 46.6
13	13 11 44.69	6.127	7 21 1.4	39.03	1 45.1
14	13 14 11.94	6.144	7 36 37.2	38.95	1 43.6
15	13 16 39.59	6.161	7 52 11.1	38.87	1 42.1
16	13 19 7.66	+6.179	− 8 7 43.0	−38.79	1 40.7
17	13 21 36.15	6.196	8 23 12.8	38.70	1 39.2
18	13 24 5.07	6.214	8 38 40.4	38.60	1 37.7
19	13 26 34.42	6.232	8 54 5.5	38.50	1 36.2
20	13 29 4.22	6.251	9 9 28.1	38.39	1 34.8
21	13 31 34.46	+6.270	− 9 24 48.0	−38.27	1 33.4
22	13 34 5.15	6.288	9 40 5.1	38.15	1 32.0
23	13 36 36.28	6.307	9 55 19.3	38.02	1 30.5
24	13 39 7.87	6.326	10 10 30.4	37.89	1 29.1
25	13 41 39.92	6.345	10 25 38.2	37.75	1 27.7
26	13 44 12.44	+6.365	−10 40 42.6	−37.61	1 26.3
27	13 46 45.42	6.385	10 55 43.5	37.46	1 24.9
28	13 49 18.88	6.405	11 10 40.7	37.31	1 23.6
29	13 51 52.83	6.425	11 25 34.2	37.15	1 22.2
30	13 54 27.26	6.446	11 40 23.7	36.98	1 20.8
31	13 57 2.19	+6.467	−11 55 9.2	−36.81	1 19.4
32	13 59 37.63	+6.488	−12 9 50.5	−36.63	1 18.1

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Mer ian sag
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h
1	13 57 2.19	+6.467	−11 55 9.2	−36.81	1 19
2	13 59 37.63	6.488	12 9 50.5	36.63	1 1
3	14 2 13.57	6.509	12 24 27.5	36.45	1 1
4	14 4 50.03	6.531	12 39 0.0	36.26	1 15
5	14 7 27.01	6.552	12 53 28.0	36.07	1 14
6	14 10 4.52	+6.574	−13 7 51.3	−35.87	1 12
7	14 12 42.57	6.596	13 22 9.7	35.66	1 11
8	14 15 21.16	6.619	13 36 23.1	35.45	1 10
9	14 18 0.30	6.642	13 50 31.3	35.23	1 8
10	14 20 39.99	6.666	14 4 34.2	35.01	1 7
11	14 23 20.25	+6.690	−14 18 31.7	−34.78	1 6
12	14 26 1.07	6.714	14 32 23.6	34.54	1 5
13	14 28 42.47	6.738	14 46 9.8	34.30	1 3
14	14 31 24.45	6.762	14 59 50.1	34.05	1 2
15	14 34 7.01	6.787	15 13 24.4	33.80	1 1
16	14 36 50.17	+6.811	−15 26 52.5	−33.54	1 0.1
17	14 39 33.92	6.835	15 40 14.2	33.27	0 58.9
18	14 42 18.27	6.860	15 53 29.4	32.99	0 57.7
19	14 45 3.22	6.885	16 6 37.9	32.71	0 56.5
20	14 47 48.77	6.910	16 19 39.5	32.42	0 55.4
21	14 50 34.91	+6.935	−16 32 34.1	−32.12	0 54.2
22	14 53 21.65	6.961	16 45 21.4	31.82	0 53.0
23	14 56 8.99	6.986	16 58 1.3	31.51	0 51.8
24	14 58 56.94	7.011	17 10 33.7	31.19	0 50.7
25	15 1 45.50	7.036	17 22 58.3	30.86	0 49.6
26	15 4 34.66	+7.062	−17 35 15.0	−30.53	0 48.5
27	15 7 24.43	7.087	17 47 23.7	30.19	0 47.4
28	15 10 14.81	7.112	17 59 24.2	29.84	0 46.3
29	15 13 5.80	7.137	18 11 16.3	29.49	0 45.2
30	15 15 57.40	7.163	18 22 59.8	29.13	0 44.1
31	15 18 49.62	+7.189	−18 34 34.6	−28.77	0 43.0
32	15 21 42.46	+7.215	−18 46 0.6	−28.40	0 42.0

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter	2.16	2.14	2.13	2.12	2.11	2.10
Horizontal Parallax	3.75	3.73	3.71	3.69	3.67	3.65

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . . .	2.09	2.08	2.07	2.07	2.06	2.06
Horizontal Parallax	3.64	3.62	3.61	3.60	3.59	3.59

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	15 21 42.46	+7.215	−18 46 0.6	−28.40	0 42.0
2	15 24 35.93	7.241	18 57 17.6	28.02	0 40.9
3	15 27 30.01	7.267	19 8 25.4	27.63	0 39.9
4	15 30 24.72	7.293	19 19 23.8	27.23	0 38.8
5	15 33 20.05	7.319	19 30 12.7	26.83	0 37.8
6	15 36 16.01	+7.345	−19 40 51.9	−26.42	0 36.8
7	15 39 12.59	7.371	19 51 21.3	26.01	0 35.8
8	15 42 9.80	7.397	20 1 40.6	25.59	0 34.8
9	15 45 7.64	7.424	20 11 49.9	25.17	0 33.8
10	15 48 6.10	7.450	20 21 48.9	24.74	0 32.8
11	15 51 5.20	+7.476	−20 31 37.3	−24.29	0 31.9
12	15 54 4.92	7.502	20 41 15.1	23.84	0 30.9
13	15 57 5.26	7.527	20 50 42.0	23.39	0 30.0
14	16 0 6.22	7.553	20 59 58.0	22.92	0 29.1
15	16 3 7.79	7.578	21 9 2.7	22.45	0 28.2
16	16 6 9.97	+7.603	−21 17 56.0	−21.97	0 27.3
17	16 9 12.76	7.628	21 26 37.8	21.49	0 26.4
18	16 12 16.15	7.653	21 35 7.8	21.00	0 25.5
19	16 15 20.12	7.678	21 43 26.0	20.51	0 24.6
20	16 18 24.67	7.702	21 51 32.3	20.00	0 23.7
21	16 21 29.80	+7.726	−21 59 26.3	−19.49	0 22.9
22	16 24 35.50	7.750	22 7 8.0	18.97	0 22.0
23	16 27 41.76	7.773	22 14 37.2	18.45	0 21.2
24	16 30 48.57	7.796	22 21 53.7	17.92	0 20.4
25	16 33 55.92	7.818	22 28 57.4	17.38	0 19.6
26	16 37 3.80	+7.840	−22 35 48.2	−16.84	0 18.8
27	16 40 12.21	7.862	22 42 26.0	16.29	0 18.0
28	16 43 21.14	7.883	22 48 50.5	15.74	0 17.2
29	16 46 30.59	7.904	22 55 1.7	15.18	0 16.4
30	16 49 40.54	7.925	23 0 59.3	14.61	0 15.6
31	16 52 50.99	+7.946	−23 6 43.3	−14.04	0 14.8
32	16 56 1.94	+7.966	−23 12 13.6	−13.46	0 14.0

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter	2.06	2.06	2.06	2.06	2.06	2.06
Horizontal Parallax	3.59	3.58	3.58	3.58	3.58	3.58

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	16 52 50.99	+7.946	−23 6 43.3	−14.04	0 14.8
2	16 56 1.94	7.966	23 12 13.6	13.46	0 14.0
3	16 59 13.37	7.986	23 17 29.9	12.88	0 13.3
4	17 2 25.27	8.006	23 22 32.2	12.29	0 12.6
5	17 5 37.64	8.025	23 27 20.4	11.70	0 11.9
6	17 8 50.46	+8.044	−23 31 54.3	−11.10	0 11.2
7	17 12 3.73	8.062	23 36 13.8	10.50	0 10.4
8	17 15 17.43	8.080	23 40 18.8	9.89	0 9.7
9	17 18 31.56	8.097	23 44 9.2	9.28	0 8.9
10	17 21 46.10	8.114	23 47 44.8	8.67	0 8.2
11	17 25 1.04	+8.131	−23 51 5.6	− 8.05	0 7.6
12	17 28 16.37	8.147	23 54 11.4	7.42	0 6.9
13	17 31 32.07	8.162	23 57 2.2	6.79	0 6.2
14	17 34 48.13	8.177	23 59 37.8	6.16	0 5.5
15	17 38 4.54	8.191	24 1 58.1	5.52	0 4.9
16	17 41 21.28	+8.204	−24 4 3.1	− 4.88	0 4.2
17	17 44 38.34	8.217	24 5 52.7	4.24	0 3.6
18	17 47 55.70	8.229	24 7 26.9	3.59	0 2.9
19	17 51 13.34	8.240	24 8 45.5	2.94	0 2.3
20	17 54 31.24	8.251	24 9 48.4	2.29	0 1.6
21	17 57 49.37	+8.261	−24 10 35.6	− 1.63	0 1.0
22	18 1 7.73	8.270	24 11 7.0	0.97	0 0.3 23 59.7
23	18 4 26.31	8.279	24 11 22.6	− 0.31	23 59.0
24	18 7 45.09	8.287	24 11 22.4	+ 0.35	23 58.4
25	18 11 4.06	8.294	24 11 6.3	1.01	23 57.8
26	18 14 23.19	+8.301	−24 10 34.2	+ 1.67	23 57.2
27	18 17 42.48	8.307	24 9 46.2	2.34	23 56.6
28	18 21 1.91	8.312	24 8 42.2	3.01	23 56.0
29	18 24 21.46	8.317	24 7 22.2	3.68	23 55.4
30	18 27 41.11	8.321	24 5 46.2	4.35	23 54.8
31	18 31 0.86	+8.325	−24 3 54.2	+ 5.02	23 54.2
32	18 34 20.70	+8.328	−24 1 46.2	+ 5.68	23 53.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter . . .	2.06	2.06	2.07	2.07	2.07	2.08	2.09
Horizontal Parallax	3.59	3.59	3.60	3.61	3.61	3.62	3.63

NOTE.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; the sign − indicates that south declinations are increasing.

JUPITER, 1914.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	19 49 13.71	+2.447	−21 26 21.4	+6.15	1 7.9
2	19 50 12.50	2.451	21 23 53.2	6.21	1 5.0
3	19 51 11.37	2.454	21 21 23.5	6.27	1 2.0
4	19 52 10.31	2.457	21 18 52.2	6.33	0 59.1
5	19 53 9.31	2.459	21 16 19.4	6.39	0 56.1
6	19 54 8.36	+2.461	−21 13 45.2	+6.45	0 53.2
7	19 55 7.46	2.463	21 11 9.5	6.52	0 50.2
8	19 56 6.60	2.465	21 8 32.4	6.58	0 47.3
9	19 57 5.78	2.467	21 5 53.9	6.63	0 44.3
10	19 58 5.00	2.468	21 3 14.0	6.69	0 41.4
11	19 59 4.24	+2.468	−21 0 32.7	+6.75	0 38.4
12	20 0 3.49	2.469	20 57 50.0	6.80	0 35.5
13	20 1 2.77	2.470	20 55 6.0	6.86	0 32.5
14	20 2 2.06	2.470	20 52 20.6	6.92	0 29.6
15	20 3 1.35	2.470	20 49 33.9	6.97	0 26.6
16	20 4 0.65	+2.470	−20 46 45.9	+7.03	0 23.7
17	20 4 59.94	2.470	20 43 56.5	7.08	0 20.7
18	20 5 59.22	2.470	20 41 5.8	7.14	0 17.8
19	20 6 58.49	2.469	20 38 13.9	7.19	0 14.8
20	20 7 57.73	2.468	20 35 20.7	7.24	0 11.9
21	20 8 56.95	+2.467	−20 32 26.4	+7.29	0 8.9
22	20 9 56.13	2.465	20 29 30.8	7.34	0 6.0
23	20 10 55.28	2.464	20 26 34.1	7.39	0 3.0
24	20 11 54.38	2.462	20 23 36.2	7.43	0 0.1 23 57.1
25	20 12 53.43	2.460	20 20 37.2	7.48	23 54.2
26	20 13 52.43	+2.457	−20 17 37.1	+7.53	23 51.2
27	20 14 51.36	2.454	20 14 35.8	7.57	23 48.2
28	20 15 50.21	2.450	20 11 33.5	7.62	23 45.3
29	20 16 48.98	2.447	20 8 30.2	7.66	23 42.3
30	20 17 47.67	2.444	20 5 25.9	7.70	23 39.4
31	20 18 46.27	+2.440	−20 2 20.7	+7.74	23 36.4
32	20 19 44.78	+2.435	−19 59 14.5	+7.77	23 33.5

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter . . .	15.51	15.45	15.42	15.43
Horizontal Parallax	1.45	1.44	1.44	1.44

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	20 19 44.78	+2.435	−19 59 14.5	+7.77	23 33.5
2	20 20 43.19	2.431	19 56 7.4	7.81	23 30.5
3	20 21 41.49	2.427	19 52 59.4	7.85	23 27.5
4	20 22 39.68	2.422	19 49 50.6	7.88	23 24.5
5	20 23 37.75	2.417	19 46 40.9	7.92	23 21.6
6	20 24 35.70	+2.412	−19 43 30.4	+7.95	23 18.6
7	20 25 33.52	2.406	19 40 19.2	7.98	23 15.6
8	20 26 31.21	2.401	19 37 7.2	8.01	23 12.6
9	20 27 28.76	2.395	19 33 54.5	8.04	23 9.7
10	20 28 26.17	2.389	19 30 41.1	8.07	23 6.7
11	20 29 23.43	+2.383	−19 27 27.0	+8.10	23 3.7
12	20 30 20.55	2.377	19 24 12.3	8.12	23 0.7
13	20 31 17.51	2.370	19 20 57.0	8.15	22 57.7
14	20 32 14.31	2.363	19 17 41.1	8.17	22 54.7
15	20 33 10.95	2.356	19 14 24.7	8.20	22 51.7
16	20 34 7.42	+2.349	−19 11 7.7	+8.22	22 48.7
17	20 35 3.71	2.342	19 7 50.1	8.24	22 45.7
18	20 35 59.82	2.334	19 4 32.2	8.25	22 42.7
19	20 36 55.75	2.326	19 1 13.9	8.27	22 39.7
20	20 37 51.48	2.318	18 57 55.1	8.29	22 36.7
21	20 38 47.01	+2.310	−18 54 36.0	+8.30	22 33.7
22	20 39 42.34	2.301	18 51 16.6	8.32	22 30.7
23	20 40 37.47	2.292	18 47 56.8	8.32	22 27.7
24	20 41 32.37	2.283	18 44 36.9	8.33	22 24.7
25	20 42 27.05	2.273	18 41 16.8	8.34	22 21.6
26	20 43 21.50	+2.263	−18 37 56.4	+8.35	22 18.6
27	20 44 15.72	2.254	18 34 35.9	8.35	22 15.5
28	20 45 9.70	2.244	18 31 15.4	8.35	22 12.5
29	20 46 3.43	2.234	18 27 54.9	8.35	22 9.4
30	20 46 56.92	2.223	18 24 34.4	8.35	22 6.4
31	20 47 50.15	+2.212	−18 21 13.9	+8.35	22 3.3
32	20 48 43.12	+2.202	−18 17 53.4	+8.35	22 0.3

Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″
Semidiameter . . .	15.47	15.55	15.66	15.81
Horizontal Parallax	1.45	1.45	1.46	1.48

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	20 46 3.43	+2.234	-18 27 54.9	+8.35	22 9.4	1	21 11 20.07	+1.807	-16 47 26.2	+7.57	20 32.6
2	20 46 56.92	2.223	18 24 34.4	8.35	22 6.4	2	21 12 3.23	1.790	16 44 25.2	7.51	20 29.3
3	20 47 50.15	2.212	18 21 13.9	8.35	22 3.3	3	21 12 45.98	1.772	16 41 25.5	7.46	20 26.1
4	20 48 43.12	2.202	18 17 53.4	8.35	22 0.3	4	21 13 28.29	1.754	16 38 27.2	7.40	20 22.9
5	20 49 35.82	2.190	18 14 33.1	8.35	21 57.2	5	21 14 10.17	1.736	16 35 30.3	7.34	20 19.6
6	20 50 28.25	+2.179	-18 11 12.9	+8.34	21 54.2	6	21 14 51.61	+1.717	-16 32 34.9	+7.27	20 16.4
7	20 51 20.40	2.167	18 7 52.9	8.33	21 51.1	7	21 15 32.61	1.699	16 29 41.0	7.21	20 13.1
8	20 52 12.27	2.155	18 4 33.2	8.32	21 48.0	8	21 16 13.16	1.680	16 26 48.6	7.15	20 9.8
9	20 53 3.85	2.143	18 1 13.7	8.31	21 45.0	9	21 16 53.27	1.662	16 23 57.8	7.08	20 6.6
10	20 53 55.15	2.131	17 57 54.4	8.30	21 41.9	10	21 17 32.92	1.642	16 21 8.7	7.01	20 3.3
11	20 54 46.16	+2.119	-17 54 35.4	+8.28	21 38.8	11	21 18 12.10	+1.623	-16 18 21.2	+6.94	20 0.0
12	20 55 36.87	2.106	17 51 16.9	8.26	21 35.7	12	21 18 50.82	1.603	16 15 35.4	6.87	19 56.7
13	20 56 27.27	2.094	17 47 58.8	8.25	21 32.6	13	21 19 29.07	1.584	16 12 51.4	6.80	19 53.4
14	20 57 17.37	2.081	17 44 41.1	8.23	21 29.5	14	21 20 6.84	1.564	16 10 9.2	6.72	19 50.1
15	20 58 7.15	2.068	17 41 23.9	8.21	21 26.4	15	21 20 44.13	1.543	16 7 28.8	6.64	19 46.8
16	20 58 56.62	+2.054	-17 38 7.2	+8.19	21 23.2	16	21 21 20.92	+1.522	-16 4 50.3	+6.56	19 43.4
17	20 59 45.76	2.041	17 34 51.0	8.16	21 20.1	17	21 21 57.21	1.502	16 2 13.8	6.48	19 40.1
18	21 0 34.58	2.027	17 31 35.4	8.13	21 17.0	18	21 22 33.00	1.481	15 59 39.3	6.40	19 36.7
19	21 1 23.06	2.013	17 28 20.5	8.11	21 13.9	19	21 23 8.29	1.460	15 57 6.8	6.31	19 33.4
20	21 2 11.20	1.998	17 25 6.3	8.08	21 10.7	20	21 23 43.06	1.438	15 54 36.4	6.22	19 30.0
21	21 2 58.99	+1.984	-17 21 52.8	+8.05	21 7.6	21	21 24 17.31	+1.416	-15 52 8.2	+6.13	19 26.7
22	21 3 46.43	1.969	17 18 40.1	8.01	21 4.4	22	21 24 51.02	1.393	15 49 42.2	6.04	19 23.3
23	21 4 33.51	1.954	17 15 28.2	7.97	21 1.3	23	21 25 24.20	1.371	15 47 18.4	5.95	19 19.9
24	21 5 20.22	1.939	17 12 17.2	7.94	20 58.1	24	21 25 56.84	1.348	15 44 56.9	5.85	19 16.5
25	21 6 6.56	1.923	17 9 7.1	7.90	20 55.0	25	21 26 28.92	1.325	15 42 37.8	5.75	19 13.1
26	21 6 52.53	+1.907	-17 5 57.9	+7.86	20 51.8	26	21 27 0.45	+1.302	-15 40 21.1	+5.65	19 9.7
27	21 7 38.11	1.891	17 2 49.8	7.81	20 48.6	27	21 27 31.42	1.278	15 38 6.8	5.54	19 6.3
28	21 8 23.31	1.875	16 59 42.8	7.77	20 45.4	28	21 28 1.82	1.255	15 35 55.0	5.44	19 2.9
29	21 9 8.11	1.858	16 56 36.8	7.72	20 42.2	29	21 28 31.65	1.231	15 33 45.7	5.33	18 59.4
30	21 9 52.50	1.841	16 53 32.1	7.67	20 39.0	30	21 29 0.90	1.207	15 31 39.0	5.22	18 56.0
31	21 10 36.49	+1.825	-16 50 28.6	+7.62	20 35.8	31	21 29 29.57	+1.182	-15 29 35.0	+5.11	18 52.5
32	21 11 20.07	+1.807	-16 47 26.2	+7.57	20 32.6	32	21 29 57.65	+1.158	-15 27 33.6	+5.00	18 49.0

Day of the Month.	6th.	14th.	22d.	30th.	Day of the Month.	7th.	15th.	23d.
	″	″	″	″		″	″	″
Semidiameter . . .	16.00	16.22	16.46	16.76	Semidiameter	17.08	17.44	17.83
Horizontal Parallax	1.50	1.52	1.54	1.57	Horizontal Parallax . . .	1.60	1.63	1.67

Note.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meri ian P sage
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h
1	21 29 29.57	+1.182	−15 29 35.0	+5.11	18 52.5	1	21 39 1.15	+0.320	−14 50 38.6	+0.93	16 59
2	21 29 57.65	1.158	15 27 33.6	5.00	18 49.0	2	21 39 8.47	0.290	14 50 18.2	0.77	16 56
3	21 30 25.14	1.133	15 25 35.0	4.88	18 45.5	3	21 39 15.06	0.259	14 50 1.5	0.62	16 52.
4	21 30 52.03	1.108	15 23 39.1	4.77	18 42.0	4	21 39 20.91	0.228	14 49 48.4	0.47	16 48.
5	21 31 18.32	1.082	15 21 45.9	4.66	18 38.5	5	21 39 26.02	0.197	14 49 39.0	0.32	16 44.
6	21 31 44.00	+1.057	−15 19 55.5	+4.54	18 35.0	6	21 39 30.40	+0.167	−14 49 33.2	+0.16	16 40.
7	21 32 9.07	1.031	15 18 8.0	4.42	18 31.5	7	21 39 34.03	0.136	14 49 31.2	+0.01	16 36.
8	21 32 33.52	1.006	15 16 23.4	4.30	18 27.9	8	21 39 36.92	0.105	14 49 33.0	−0.15	16 32.
9	21 32 57.35	0.980	15 14 41.7	4.18	18 24.4	9	21 39 39.07	0.074	14 49 38.5	0.31	16 28.
10	21 33 20.56	0.954	15 13 2.9	4.05	18 20.8	10	21 39 40.47	0.043	14 49 47.8	0.46	16 25.
11	21 33 43.13	+0.927	−15 11 27.2	+3.92	18 17.2	11	21 39 41.12	+0.011	−14 50 0.8	−0.62	16 21.1
12	21 34 5.06	0.900	15 9 54.5	3.80	18 13.7	12	21 39 41.02	−0.020	14 50 17.6	0.77	16 17.1
13	21 34 26.35	0.874	15 8 24.8	3.67	18 10.1	13	21 39 40.17	0.051	14 50 38.1	0.93	16 13.2
14	21 34 47.00	0.847	15 6 58.3	3.54	18 6.5	14	21 39 38.57	0.082	14 51 2.4	1.09	16 9.2
15	21 35 6.99	0.819	15 5 34.9	3.40	18 2.9	15	21 39 36.21	0.114	14 51 30.5	1.25	16 5.2
16	21 35 26.31	+0.791	−15 4 14.8	+3.27	17 59.3	16	21 39 33.10	−0.145	−14 52 2.3	−1.40	16 1.2
17	21 35 44.96	0.763	15 2 57.9	3.13	17 55.7	17	21 39 29.25	0.176	14 52 37.9	1.56	15 57.2
18	21 36 2.94	0.735	15 1 44.3	3.00	17 52.0	18	21 39 24.64	0.208	14 53 17.2	1.72	15 53.2
19	21 36 20.24	0.707	15 0 34.0	2.86	17 48.3	19	21 39 19.27	0.239	14 54 0.2	1.87	15 49.2
20	21 36 36.86	0.678	14 59 27.1	2.72	17 44.7	20	21 39 13.15	0.270	14 54 46.9	2.02	15 45.1
21	21 36 52.79	+0.649	−14 58 23.6	+2.57	17 41.0	21	21 39 6.29	−0.301	−14 55 37.3	−2.17	15 41.1
22	21 37 8.02	0.620	14 57 23.6	2.43	17 37.3	22	21 38 58.69	0.332	14 56 31.4	2.33	15 37.0
23	21 37 22.55	0.591	14 56 27.0	2.28	17 33.6	23	21 38 50.34	0.363	14 57 29.1	2.48	15 32.9
24	21 37 36.38	0.561	14 55 33.9	2.14	17 29.9	24	21 38 41.26	0.394	14 58 30.4	2.63	15 28.8
25	21 37 49.50	0.532	14 54 44.4	1.99	17 26.2	25	21 38 31.44	0.424	14 59 35.3	2.78	15 24.7
26	21 38 1.90	+0.502	−14 53 58.5	+1.84	17 22.4	26	21 38 20.90	−0.454	−15 0 43.8	−2.92	15 20.6
27	21 38 13.58	0.472	14 53 16.1	1.69	17 18.7	27	21 38 9.64	0.484	15 1 55.8	3.07	15 16.5
28	21 38 24.54	0.442	14 52 37.3	1.54	17 14.9	28	21 37 57.66	0.514	15 3 11.2	3.21	15 12.4
29	21 38 34.78	0.412	14 52 2.2	1.39	17 11.2	29	21 37 44.98	0.543	15 4 30.0	3.35	15 8.2
30	21 38 44.30	0.381	14 51 30.7	1.24	17 7.4	30	21 37 31.60	0.572	15 5 52.1	3.49	15 4.1
31	21 38 53.09	+0.351	−14 51 2.8	+1.08	17 3.6	31	21 37 17.52	−0.601	−15 7 17.5	−3.62	14 59.9
32	21 39 1.15	+0.320	−14 50 38.6	+0.93	16 59.8	32	21 37 2.75	−0.629	−15 8 46.1	−3.75	14 55.7

Day of the Month.	1st.	9th.	17th.	25th.	Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″		″	″	″	″
Semidiameter . . .	18.26	18.72	19.21	19.70	Semidiameter . . .	20.21	20.74	21.25	21.74
Horizontal Parallax	1.71	1.75	1.80	1.84	Horizontal Parallax	1.89	1.94	1.99	2.03

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	21 37 17.52	−0.601	−15 7 17.5	−3.62	14 59.9	1	21 25 15.14	−1.242	−16 12 17.6	−6.26	12 45.9
2	21 37 2.75	0.629	15 8 46.1	3.75	14 55.7	2	21 24 45.23	1.250	16 14 48.2	6.28	12 41.5
3	21 36 47.31	0.657	15 10 17.8	3.89	14 51.5	3	21 24 15.11	1.259	16 17 19.2	6.30	12 37.1
4	21 36 31.20	0.685	15 11 52.7	4.02	14 47.3	4	21 23 44.81	1.266	16 19 50.4	6.30	12 32.6
5	21 36 14.43	0.712	15 13 30.6	4.14	14 43.1	5	21 23 14.35	1.272	16 22 21.8	6.31	12 28.2
6	21 35 57.02	−0.739	−15 15 11.6	−4.27	14 38.9	6	21 22 43.75	−1.277	−16 24 53.2	−6.31	12 23.8
7	21 35 38.97	0.765	15 16 55.5	4.39	14 34.6	7	21 22 13.03	1.282	16 27 24.6	6.31	12 19.3
8	21 35 20.28	0.798	15 18 42.2	4.50	14 30.4	8	21 21 42.21	1.286	16 29 55.9	6.30	12 14.9
9	21 35 0.96	0.817	15 20 31.7	4.62	14 26.2	9	21 21 11.31	1.288	16 32 26.9	6.28	12 10.4
10	21 34 41.03	0.843	15 22 24.0	4.73	14 21.9	10	21 20 40.36	1.290	16 34 57.6	6.27	12 6.0
11	21 34 20.50	−0.868	−15 24 18.9	−4.84	14 17.6	11	21 20 9.37	−1.291	−16 37 27.8	−6.25	12 1.5
12	21 33 59.37	0.892	15 26 16.5	4.95	14 13.3	12	21 19 38.38	1.291	16 39 57.5	6.22	11 57.1
13	21 33 37.66	0.917	15 28 16.6	5.05	14 9.0	13	21 19 7.39	1.290	16 42 26.5	6.19	11 52.6
14	21 33 15.39	0.940	15 30 19.1	5.15	14 4.7	14	21 18 36.43	1.288	16 44 54.7	6.15	11 48.2
15	21 32 52.56	0.962	15 32 24.0	5.25	14 0.4	15	21 18 5.54	1.285	16 47 22.0	6.12	11 43.7
16	21 32 29.20	−0.984	−15 34 31.2	−5.35	13 56.1	16	21 17 34.72	−1.282	−16 49 48.3	−6.08	11 39.3
17	21 32 5.31	1.006	15 36 40.6	5.44	13 51.8	17	21 17 4.01	1.277	16 52 13.6	6.03	11 34.8
18	21 31 40.89	1.027	15 38 52.1	5.52	13 47.4	18	21 16 33.42	1.271	16 54 37.7	5.98	11 30.4
19	21 31 15.98	1.048	15 41 5.7	5.60	13 43.1	19	21 16 2.99	1.264	16 57 0.6	5.92	11 26.0
20	21 30 50.59	1.067	15 43 21.2	5.68	13 38.7	20	21 15 32.73	1.257	16 59 22.1	5.86	11 21.5
21	21 30 24.73	−1.087	−15 45 38.5	−5.75	13 34.4	21	21 15 2.67	−1.247	−17 1 42.0	−5.80	11 17.1
22	21 29 58.43	1.105	15 47 57.5	5.82	13 30.0	22	21 14 32.84	1.238	17 4 0.3	5.72	11 12.7
23	21 29 31.69	1.122	15 50 18.1	5.89	13 25.6	23	21 14 3.24	1.227	17 6 16.8	5.65	11 8.3
24	21 29 4.56	1.139	15 52 40.2	5.95	13 21.2	24	21 13 33.91	1.216	17 8 31.5	5.57	11 3.8
25	21 28 37.04	1.155	15 55 3.7	6.00	13 16.8	25	21 13 4.88	1.203	17 10 44.4	5.50	10 59.4
26	21 28 9.14	−1.170	−15 57 28.5	−6.05	13 12.4	26	21 12 36.17	−1.189	−17 12 55.3	−5.41	10 55.0
27	21 27 40.90	1.184	15 59 54.5	6.10	13 8.0	27	21 12 7.80	1.175	17 15 4.2	5.32	10 50.6
28	21 27 12.32	1.197	16 2 21.5	6.14	13 3.6	28	21 11 39.77	1.160	17 17 10.9	5.23	10 46.2
29	21 26 43.43	1.210	16 4 49.4	6.18	12 59.2	29	21 11 12.12	1.144	17 19 15.4	5.14	10 41.8
30	21 26 14.26	1.221	16 7 18.2	6.21	12 54.8	30	21 10 44.86	1.127	17 21 17.5	5.04	10 37.4
31	21 25 44.82	−1.232	−16 9 47.6	−6.24	12 50.3	31	21 10 18.03	−1.109	−17 23 17.3	−4.94	10 33.1
32	21 25 15.14	−1.242	−16 12 17.6	−6.26	12 45.9	32	21 9 51.63	−1.091	−17 25 14.6	−4.84	10 28.7

Day of the Month.	4th.	12th.	20th.	28th.	Day of the Month.	5th.	13th.	21st.	29th.
	″	″	″	″		″	″	″	″
Semidiameter . . .	22.18	22.58	22.91	23.13	Semidiameter . . .	23.27	23.29	23.21	23.02
Horizontal Parallax	2.07	2.11	2.14	2.16	Horizontal Parallax	2.18	2.18	2.17	2.15

NOTE.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; the sign − indicates that south declinations are increasing.

JUPITER, 1914.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	21 9 51.63	−1.091	−17 25 14.6	−4.84	10 28.7
2	21 9 25.68	1.071	17 27 9.5	4.73	10 24.4
3	21 9 0.19	1.051	17 29 1.9	4.63	10 20.0
4	21 8 35.18	1.031	17 30 51.7	4.52	10 15.7
5	21 8 10.68	1.010	17 32 38.8	4.40	10 11.3
6	21 7 46.71	−0.988	−17 34 23.1	−4.29	10 7.0
7	21 7 23.27	0.965	17 36 4.7	4.17	10 2.7
8	21 7 0.37	0.942	17 37 43.5	4.05	9 58.4
9	21 6 38.03	0.919	17 39 19.4	3.93	9 54.1
10	21 6 16.28	0.894	17 40 52.4	3.81	9 49.8
11	21 5 55.12	−0.869	−17 42 22.5	−3.69	9 45.5
12	21 5 34.57	0.843	17 43 49.5	3.56	9 41.2
13	21 5 14.65	0.817	17 45 13.5	3.44	9 37.0
14	21 4 55.37	0.790	17 46 34.5	3.31	9 32.7
15	21 4 36.75	0.762	17 47 52.3	3.17	9 28.5
16	21 4 18.79	−0.734	−17 49 6.9	−3.04	9 24.3
17	21 4 1.50	0.706	17 50 18.3	2.91	9 20.1
18	21 3 44.89	0.677	17 51 26.5	2.77	9 15.9
19	21 3 28.99	0.647	17 52 31.5	2.64	9 11.7
20	21 3 13.81	0.617	17 53 33.1	2.50	9 7.5
21	21 2 59.35	−0.587	−17 54 31.3	−2.35	9 3.4
22	21 2 45.63	0.556	17 55 26.2	2.22	8 59.2
23	21 2 32.65	0.525	17 56 17.7	2.07	8 55.0
24	21 2 20.42	0.494	17 57 5.8	1.93	8 50.9
25	21 2 8.94	0.462	17 57 50.5	1.79	8 46.8
26	21 1 58.23	−0.430	−17 58 31.8	−1.65	8 42.7
27	21 1 48.29	0.398	17 59 9.6	1.50	8 38.6
28	21 1 39.13	0.365	17 59 44.0	1.36	8 34.5
29	21 1 30.74	0.332	18 0 14.9	1.22	8 30.5
30	21 1 23.13	0.301	18 0 42.4	1.07	8 26.4
31	21 1 16.31	−0.268	−18 1 6.4	−0.93	8 22.3
32	21 1 10.28	−0.235	−18 1 27.0	−0.78	8 18.3

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m
1	21 1 16.31	−0.268	−18 1 6.4	−0.93	8 22.3
2	21 1 10.28	0.235	18 1 27.0	0.78	8 18.3
3	21 1 5.03	0.202	18 1 44.1	0.64	8 14.3
4	21 1 0.58	0.169	18 1 57.8	0.50	8 10.3
5	21 0 56.93	0.135	18 2 8.0	0.35	8 6.3
6	21 0 54.08	−0.102	−18 2 14.8	−0.21	8 2.3
7	21 0 52.02	0.069	18 2 18.1	−0.07	7 58.4
8	21 0 50.76	0.036	18 2 18.0	+0.07	7 54.4
9	21 0 50.30	−0.002	18 2 14.4	0.22	7 50.5
10	21 0 50.64	+0.031	18 2 7.4	0.36	7 46.6
11	21 0 51.79	+0.065	−18 1 57.0	+0.50	7 42.7
12	21 0 53.74	0.098	18 1 43.2	0.65	7 38.8
13	21 0 56.49	0.131	18 1 25.8	0.79	7 34.9
14	21 1 0.05	0.165	18 1 5.1	0.93	7 31.0
15	21 1 4.41	0.198	18 0 40.9	1.08	7 27.2
16	21 1 9.57	+0.232	−18 0 13.3	+1.22	7 23.3
17	21 1 15.53	0.265	17 59 42.2	1.36	7 19.5
18	21 1 22.29	0.298	17 59 7.8	1.50	7 15.7
19	21 1 29.84	0.331	17 58 29.9	1.65	7 11.9
20	21 1 38.20	0.365	17 57 48.6	1.79	7 8.1
21	21 1 47.35	+0.398	−17 57 3.9	+1.93	7 4.3
22	21 1 57.29	0.430	17 56 15.8	2.07	7 0.6
23	21 2 8.00	0.463	17 55 24.3	2.21	6 56.8
24	21 2 19.50	0.495	17 54 29.5	2.35	6 53.1
25	21 2 31.78	0.528	17 53 31.3	2.49	6 49.3
26	21 2 44.83	+0.559	−17 52 29.8	+2.63	6 45.6
27	21 2 58.62	0.590	17 51 25.0	2.77	6 41.9
28	21 3 13.17	0.622	17 50 16.9	2.90	6 38.2
29	21 3 28.48	0.653	17 49 5.5	3.04	6 34.5
30	21 3 44.53	0.684	17 47 50.9	3.17	6 30.9
31	21 4 1.31	+0.715	−17 46 33.0	+3.31	6 27.2
32	21 4 18.84	+0.745	−17 45 11.9	+3.45	6 23.6

Day of the Month.	6th.	14th.	22th.	30th.
	″	″	″	″
Semidiameter . . .	22.73	22.37	21.94	21.47
Horizontal Parallax	2.12	2.09	2.05	2.01

Day of the Month.	8th.	16th.	24th.
	″	″	″
Semidiameter	20.97	20.45	19.93
Horizontal Parallax . . .	1.96	1.91	1.86

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	21 4 18.84	+0.745	−17 45 11.9	+3.45	6 23.6
2	21 4 37.09	0.775	17 43 47.6	3.58	6 20.0
3	21 4 56.06	0.805	17 42 20.2	3.71	6 16.4
4	21 5 15.74	0.835	17 40 49.6	3.84	6 12.8
5	21 5 36.12	0.864	17 39 15.8	3.97	6 9.2
6	21 5 57.20	+0.893	−17 37 38.9	+4.10	6 5.6
7	21 6 18.98	0.922	17 35 58.9	4.23	6 2.1
8	21 6 41.45	0.950	17 34 15.8	4.36	5 58.5
9	21 7 4.60	0.978	17 32 29.5	4.49	5 55.0
10	21 7 28.42	1.007	17 30 40.1	4.62	5 51.4
11	21 7 52.92	+1.035	−17 28 47.7	+4.75	5 47.9
12	21 8 18.08	1.062	17 26 52.3	4.87	5 44.4
13	21 8 43.89	1.089	17 24 53.8	5.00	5 40.9
14	21 9 10.36	1.116	17 22 52.2	5.13	5 37.4
15	21 9 37.47	1.143	17 20 47.7	5.25	5 33.9
16	21 10 5.22	+1.169	−17 18 40.1	+5.38	5 30.5
17	21 10 33.59	1.195	17 16 29.5	5.50	5 27.0
18	21 11 2.58	1.221	17 14 16.0	5.62	5 23.5
19	21 11 32.20	1.247	17 11 59.4	5.75	5 20.1
20	21 12 2.42	1.272	17 9 39.9	5.87	5 16.6
21	21 12 33.24	+1.297	−17 7 17.4	+6.00	5 13.2
22	21 13 4.65	1.321	17 4 52.0	6.12	5 9.8
23	21 13 36.64	1.345	17 2 23.8	6.24	5 6.4
24	21 14 9.19	1.368	16 59 52.7	6.35	5 3.1
25	21 14 42.31	1.391	16 57 18.8	6.47	4 59.7
26	21 15 15.98	+1.414	−16 54 42.0	+6.59	4 56.3
27	21 15 50.20	1.437	16 52 2.5	6.70	4 52.9
28	21 16 24.96	1.459	16 49 20.2	6.82	4 49.6
29	21 17 0.25	1.481	16 46 35.2	6.93	4 46.2
30	21 17 36.05	1.502	16 43 47.5	7.04	4 42.8
31	21 18 12.37	+1.524	−16 40 57.1	+7.15	4 39.5
32	21 18 49.19	+1.545	−16 38 4.0	+7.27	4 36.2

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	21 18 12.37	+1.524	−16 40 57.1	+ 7.15	4 39.5
2	21 18 49.19	1.545	16 38 4.0	7.27	4 36.2
3	21 19 26.51	1.565	16 35 8.2	7.38	4 32.9
4	21 20 4.32	1.585	16 32 9.7	7.49	4 29.6
5	21 20 42.61	1.605	16 29 8.6	7.60	4 26.3
6	21 21 21.38	+1.625	−16 26 4.9	+ 7.71	4 23.1
7	21 22 0.62	1.644	16 22 58.6	7.81	4 19.8
8	21 22 40.31	1.663	16 19 49.8	7.92	4 16.5
9	21 23 20.46	1.682	16 16 38.3	8.03	4 13.2
10	21 24 1.05	1.700	16 13 24.3	8.13	4 10.0
11	21 24 42.09	+1.719	−16 10 7.8	+ 8.24	4 6.7
12	21 25 23.56	1.737	16 6 48.7	8.35	4 3.5
13	21 26 5.46	1.755	16 3 27.1	8.45	4 0.2
14	21 26 47.78	1.772	16 0 3.0	8.55	3 57.0
15	21 27 30.50	1.788	15 56 36.4	8.66	3 53.8
16	21 28 13.62	+1.805	−15 53 7.4	+ 8.76	3 50.6
17	21 28 57.14	1.822	15 49 36.0	8.86	3 47.4
18	21 29 41.06	1.838	15 46 2.2	8.96	3 44.2
19	21 30 25.36	1.853	15 42 25.9	9.06	3 41.0
20	21 31 10.02	1.868	15 38 47.3	9.16	3 37.8
21	21 31 55.04	+1.883	−15 35 6.4	+ 9.25	3 34.6
22	21 32 40.42	1.898	15 31 23.2	9.35	3 31.4
23	21 33 26.15	1.912	15 27 37.8	9.44	3 28.2
24	21 34 12.21	1.926	15 23 50.1	9.53	3 25.0
25	21 34 58.60	1.940	15 20 0.2	9.62	3 21.9
26	21 35 45.32	+1.953	−15 16 8.1	+ 9.71	3 18.7
27	21 36 32.36	1.966	15 12 13.8	9.80	3 15.6
28	21 37 19.71	1.979	15 8 17.4	9.89	3 12.4
29	21 38 7.35	1.991	15 4 18.9	9.98	3 9.3
30	21 38 55.29	2.003	15 0 18.3	10.07	3 6.1
31	21 39 43.51	+2.015	−14 56 15.6	+10.15	3 3.0
32	21 40 32.01	+2.027	−14 52 10.9	+10.23	2 59.9

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter . . .	19.43	18.94	18.48	18.05
Horizontal Parallax	1.82	1.77	1.73	1.69

Day of the Month.	3d.	11th.	19th.	27th.
	″	″	″	″
Semidiameter . . .	17.66	17.30	16.97	16.69
Horizontal Parallax	1.65	1.62	1.59	1.56

NOTE.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; the sign − indicates that south declinations are increasing.

SATURN, 1914.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	4 46 0.71	−0.724	+20 40 26.6	−0.83	10 3.1
2	4 45 43.46	0.712	20 40 6.8	0.81	9 58.8
3	4 45 26.54	0.698	20 39 47.7	0.78	9 54.6
4	4 45 9.93	0.685	20 39 29.2	0.76	9 50.4
5	4 44 53.63	0.672	20 39 11.3	0.73	9 46.2
6	4 44 37.65	−0.659	+20 38 54.1	−0.70	9 42.0
7	4 44 22.00	0.645	20 38 37.5	0.67	9 37.8
8	4 44 6.69	0.631	20 38 21.6	0.65	9 33.7
9	4 43 51.72	0.616	20 38 6.5	0.62	9 29.5
10	4 43 37.11	0.601	20 37 52.0	0.59	9 25.4
11	4 43 22.86	−0.586	+20 37 38.3	−0.56	9 21.2
12	4 43 8.97	0.571	20 37 25.3	0.52	9 17.0
13	4 42 55.46	0.555	20 37 13.2	0.49	9 12.8
14	4 42 42.34	0.539	20 37 1.8	0.46	9 8.6
15	4 42 29.60	0.522	20 36 51.1	0.43	9 4.5
16	4 42 17.25	−0.506	+20 36 41.2	−0.39	9 0.4
17	4 42 5.30	0.489	20 36 32.2	0.36	8 56.3
18	4 41 53.75	0.472	20 36 24.0	0.32	8 52.2
19	4 41 42.62	0.455	20 36 16.7	0.28	8 48.1
20	4 41 31.91	0.438	20 36 10.3	0.25	8 44.0
21	4 41 21.62	−0.420	+20 36 4.7	−0.22	8 39.9
22	4 41 11.76	0.402	20 35 59.9	0.18	8 35.8
23	4 41 2.34	0.383	20 35 56.0	0.14	8 31.7
24	4 40 53.35	0.365	20 35 53.0	0.10	8 27.6
25	4 40 44.81	0.346	20 35 51.0	0.06	8 23.5
26	4 40 36.72	−0.328	+20 35 49.9	−0.02	8 19.4
27	4 40 29.08	0.309	20 35 49.7	+0.01	8 15.4
28	4 40 21.90	0.289	20 35 50.4	0.05	8 11.3
29	4 40 15.19	0.270	20 35 52.1	0.09	8 7.3
30	4 40 8.94	0.250	20 35 54.7	0.13	8 3.2
31	4 40 3.15	−0.231	+20 35 58.3	+0.17	7 59.2
32	4 39 57.83	−0.212	+20 36 2.8	+0.21	7 55.2

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter . . .	9.51	9.42	9.33	9.22
Horizontal Parallax	1.08	1.07	1.06	1.05

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Merid ian P sage.
	h m s	s	° ′ ″	″	h
1	4 39 57.83	−0.212	+20 36 2.8	+0.21	7 55
2	4 39 52.98	0.192	20 36 8.3	0.25	7 51
3	4 39 48.61	0.172	20 36 14.7	0.28	7 47
4	4 39 44.71	0.152	20 36 22.0	0.32	7 43
5	4 39 41.29	0.132	20 36 30.3	0.36	7 39
6	4 39 38.34	−0.113	+20 36 39.5	+0.40	7 35.
7	4 39 35.87	0.093	20 36 49.7	0.44	7 31.
8	4 39 33.87	0.073	20 37 0.9	0.48	7 27.
9	4 39 32.36	0.053	20 37 13.0	0.52	7 23.
10	4 39 31.32	0.033	20 37 26.1	0.56	7 19.
11	4 39 30.77	−0.013	+20 37 40.1	+0.60	7 15.
12	4 39 30.69	+0.007	20 37 55.0	0.64	7 11.
13	4 39 31.09	0.027	20 38 10.8	0.68	7 7.
14	4 39 31.97	0.047	20 38 27.5	0.72	7 3.
15	4 39 33.33	0.067	20 38 45.2	0.76	6 59.
16	4 39 35.17	+0.087	+20 39 3.9	+0.80	6 55.
17	4 39 37.49	0.107	20 39 23.4	0.84	6 52.
18	4 39 40.29	0.127	20 39 43.8	0.87	6 48.
19	4 39 43.57	0.147	20 40 5.2	0.91	6 44.
20	4 39 47.33	0.167	20 40 27.6	0.95	6 40.
21	4 39 51.56	+0.187	+20 40 50.8	+0.98	6 36.
22	4 39 56.27	0.206	20 41 14.9	1.02	6 32.7
23	4 40 1.45	0.226	20 41 39.9	1.06	6 28.8
24	4 40 7.11	0.246	20 42 5.7	1.09	6 25.
25	4 40 13.25	0.265	20 42 32.4	1.13	6 21.2
26	4 40 19.86	+0.285	+20 43 0.0	+1.17	6 17.4
27	4 40 26.94	0.305	20 43 28.4	1.20	6 13.6
28	4 40 34.48	0.324	20 43 57.6	1.23	6 9.8
29	4 40 42.49	0.343	20 44 27.6	1.27	6 6.0
30	4 40 50.96	0.362	20 44 58.5	1.30	6 2.2
31	4 40 59.89	+0.381	+20 45 30.1	+1.33	5 58.4
32	4 41 9.27	+0.400	+20 46 2.5	+1.37	5 54.6

Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″
Semidiameter . . .	9.09	8.97	8.84	8.71
Horizontal Parallax	1.03	1.02	1.00	0.99

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

SATURN, 1914.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	4 40 42.49	+0.343	+20 44 27.6	+1.27	6 6.0	1	4 48 22.95	+0.870	+21 5 26.2	+2.01	4 11.7
2	4 40 50.96	0.362	20 44 58.5	1.30	6 2.2	2	4 48 44.01	0.884	21 6 14.7	2.02	4 8.1
3	4 40 59.89	0.381	20 45 30.1	1.33	5 58.4	3	4 49 5.40	0.898	21 7 3.4	2.03	4 4.6
4	4 41 9.27	0.400	20 46 2.5	1.37	5 54.6	4	4 49 27.13	0.912	21 7 52.4	2.05	4 1.0
5	4 41 19.11	0.419	20 46 35.7	1.40	5 50.8	5	4 49 49.20	0.926	21 8 41.7	2.06	3 57.4
6	4 41 29.39	+0.438	+20 47 9.6	+1.43	5 47.1	6	4 50 11.59	+0.940	+21 9 31.2	+2.07	3 53.8
7	4 41 40.12	0.456	20 47 44.2	1.46	5 43.3	7	4 50 34.30	0.953	21 10 20.9	2.08	3 50.3
8	4 41 51.29	0.475	20 48 19.6	1.49	5 39.6	8	4 50 57.32	0.965	21 11 10.8	2.08	3 46.7
9	4 42 2.90	0.493	20 48 55.7	1.52	5 35.8	9	4 51 20.65	0.978	21 12 1.0	2.09	3 43.2
10	4 42 14.95	0.511	20 49 32.5	1.55	5 32.1	10	4 51 44.29	0.991	21 12 51.3	2.10	3 39.7
11	4 42 27.43	+0.529	+20 50 9.9	+1.57	5 28.4	11	4 52 8.23	+1.004	+21 13 41.9	+2.11	3 36.2
12	4 42 40.33	0.546	20 50 48.0	1.60	5 24.7	12	4 52 32.47	1.016	21 14 32.5	2.12	3 32.6
13	4 42 53.65	0.564	20 51 26.8	1.63	5 21.0	13	4 52 57.01	1.029	21 15 23.4	2.12	3 29.1
14	4 43 7.40	0.581	20 52 6.2	1.65	5 17.3	14	4 53 21.84	1.041	21 16 14.3	2.12	3 25.6
15	4 43 21.56	0.599	20 52 46.2	1.68	5 13.6	15	4 53 46.95	1.052	21 17 5.3	2.13	3 22.1
16	4 43 36.15	+0.616	+20 53 26.8	+1.70	5 9.9	16	4 54 12.34	+1.064	+21 17 56.4	+2.13	3 18.6
17	4 43 51.15	0.633	20 54 7.9	1.72	5 6.2	17	4 54 38.01	1.075	21 18 47.6	2.13	3 15.1
18	4 44 6.55	0.650	20 54 49.7	1.75	5 2.5	18	4 55 3.95	1.086	21 19 38.8	2.13	3 11.6
19	4 44 22.35	0.667	20 55 32.0	1.78	4 58.8	19	4 55 30.16	1.097	21 20 30.1	2.14	3 8.1
20	4 44 38.56	0.683	20 56 15.0	1.80	4 55.2	20	4 55 56.63	1.108	21 21 21.4	2.14	3 4.6
21	4 44 55.16	+0.700	+20 56 58.5	+1.82	4 51.5	21	4 56 23.37	+1.119	+21 22 12.8	+2.15	3 1.1
22	4 45 12.16	0.716	20 57 42.4	1.84	4 47.9	22	4 56 50.36	1.130	21 23 4.1	2.15	2 57.6
23	4 45 29.55	0.732	20 58 26.8	1.86	4 44.2	23	4 57 17.60	1.140	21 23 55.4	2.14	2 54.1
24	4 45 47.33	0.749	20 59 11.7	1.88	4 40.6	24	4 57 45.08	1.150	21 24 46.6	2.13	2 50.6
25	4 46 5.49	0.765	20 59 57.1	1.90	4 37.0	25	4 58 12.80	1.160	21 25 37.8	2.13	2 47.1
26	4 46 24.03	+0.780	+21 0 42.9	+1.92	4 33.4	26	4 58 40.76	+1.169	+21 26 28.9	+2.13	2 43.6
27	4 46 42.94	0.796	21 1 29.1	1.93	4 29.7	27	4 59 8.95	1.179	21 27 20.0	2.12	2 40.2
28	4 47 2.22	0.811	21 2 15.8	1.95	4 26.1	28	4 59 37.36	1.188	21 28 10.9	2.12	2 36.7
29	4 47 21.87	0.826	21 3 2.8	1.97	4 22.5	29	5 0 5.99	1.197	21 29 1.7	2.11	2 33.3
30	4 47 41.88	0.841	21 3 50.2	1.98	4 18.9	30	5 0 34.84	1.206	21 29 52.4	2.11	2 29.8
31	4 48 2.24	+0.855	+21 4 38.0	+2.00	4 15.3	31	5 1 3.90	+1.214	+21 30 42.9	+2.10	2 26.4
32	4 48 22.95	+0.870	+21 5 26.2	+2.01	4 11.7	32	5 1 33.15	+1.223	+21 31 33.2	+2.09	2 22.9

Day of the Month.	6th.	14th.	22d.	30th.	Day of the Month.	7th.	15th.	23d.
	″	″	″	″		″	″	″
Semidiameter . . .	8.58	8.45	8.34	8.23	Semidiameter	8.13	8.04	7.96
Horizontal Parallax	0.97	0.96	0.95	0.93	Horizontal Parallax . . .	0.92	0.91	0.90

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	5 1 3.90	+1.214	+21 30 42.9	+2.10	2 26.4
2	5 1 33.15	1.223	21 31 33.2	2.09	2 22.9
3	5 2 2.60	1.231	21 32 23.4	2.09	2 19.5
4	5 2 32.25	1.239	21 33 13.4	2.08	2 16.1
5	5 3 2.10	1.247	21 34 3.2	2.07	2 12.7
6	5 3 32.13	+1.255	+21 34 52.7	+2.06	2 9.2
7	5 4 2.33	1.262	21 35 42.0	2.05	2 5.8
8	5 4 32.70	1.269	21 36 31.1	2.04	2 2.3
9	5 5 3.25	1.276	21 37 20.0	2.03	1 58.9
10	5 5 33.96	1.283	21 38 8.5	2.02	1 55.5
11	5 6 4.83	+1.290	+21 38 56.8	+2.01	1 52.1
12	5 6 35.86	1.296	21 39 44.8	1.99	1 48.7
13	5 7 7.05	1.302	21 40 32.6	1.98	1 45.3
14	5 7 38.38	1.308	21 41 20.0	1.97	1 41.8
15	5 8 9.86	1.314	21 42 7.2	1.96	1 38.4
16	5 8 41.47	+1.320	+21 42 54.0	+1.94	1 35.0
17	5 9 13.23	1.326	21 43 40.4	1.92	1 31.6
18	5 9 45.12	1.331	21 44 26.5	1.91	1 28.2
19	5 10 17.13	1.336	21 45 12.2	1.90	1 24.8
20	5 10 49.27	1.341	21 45 57.6	1.88	1 21.4
21	5 11 21.53	+1.346	+21 46 42.6	+1.86	1 18.0
22	5 11 53.90	1.351	21 47 27.1	1.85	1 14.6
23	5 12 26.37	1.355	21 48 11.3	1.83	1 11.2
24	5 12 58.95	1.359	21 48 55.0	1.82	1 7.8
25	5 13 31.63	1.363	21 49 38.4	1.80	1 4.5
26	5 14 4.40	+1.367	+21 50 21.3	+1.78	1 1.1
27	5 14 37.26	1.371	21 51 3.8	1.76	0 57.7
28	5 15 10.20	1.374	21 51 45.8	1.74	0 54.3
29	5 15 43.22	1.377	21 52 27.3	1.72	0 50.9
30	5 16 16.31	1.380	21 53 8.3	1.70	0 47.5
31	5 16 49.47	+1.383	+21 53 49.0	+1.68	0 44.1
32	5 17 22.70	+1.386	+21 54 29.2	+1.66	0 40.7

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meri ian P sage
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h
1	5 17 22.70	+1.386	+21 54 29.2	+1.66	0 40
2	5 17 55.99	1.388	21 55 8.8	1.64	0 37
3	5 18 29.32	1.390	21 55 48.0	1.62	0 34
4	5 19 2.70	1.392	21 56 26.6	1.60	0 30
5	5 19 36.12	1.393	21 57 4.8	1.58	0 27
6	5 20 9.58	+1.395	+21 57 42.4	+1.55	0 23.
7	5 20 43.08	1.397	21 58 19.5	1.53	0 20.
8	5 21 16.62	1.398	21 58 56.1	1.51	0 17.
9	5 21 50.19	1.399	21 59 32.2	1.49	0 13.
10	5 22 23.77	1.400	22 0 7.8	1.47	0 10.
11	5 22 57.37	+1.400	+22 0 42.8	+1.45	0 7.
12	5 23 31.00	1.401	22 1 17.3	1.42	0 3.
13	5 24 4.64	1.402	22 1 51.3	1.40	0 0. 23 56.
14	5 24 38.28	1.402	22 2 24.7	1.38	23 53.
15	5 25 11.92	1.402	22 2 57.6	1.36	23 50.
16	5 25 45.57	+1.402	+22 3 29.9	+1.33	23 46.
17	5 26 19.20	1.401	22 4 1.6	1.31	23 43.
18	5 26 52.83	1.401	22 4 32.8	1.29	23 40.
19	5 27 26.45	1.400	22 5 3.4	1.27	23 36.
20	5 28 0.04	1.399	22 5 33.5	1.24	23 33.
21	5 28 33.61	+1.398	+22 6 3.0	+1.22	23 29.8
22	5 29 7.14	1.396	22 6 31.9	1.19	23 26.
23	5 29 40.63	1.395	22 7 0.2	1.17	23 23.1
24	5 30 14.09	1.393	22 7 28.0	1.15	23 19.7
25	5 30 47.50	1.391	22 7 55.2	1.12	23 16.3
26	5 31 20.87	+1.389	+22 8 21.8	+1.09	23 13.0
27	5 31 54.18	1.386	22 8 47.8	1.07	23 9.6
28	5 32 27.42	1.384	22 9 13.3	1.05	23 6.2
29	5 33 0.60	1.381	22 9 38.1	1.02	23 2.8
30	5 33 33.71	1.378	22 10 2.4	1.00	22 59.5
31	5 34 6.74	+1.375	+22 10 26.1	+0.97	22 56.1
32	5 34 39.70	+1.371	+22 10 49.2	+0.95	22 52.7

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter . . .	7.89	7.83	7.79	7.75
Horizontal Parallax	0.90	0.89	0.88	0.88

Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″
Semidiameter . . .	7.73	7.72	7.72	7.73
Horizontal Parallax	0.88	0.88	0.88	0.88

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	5 34 6.74	+1.375	+22 10 26.1	+0.97	22 56.1	1	5 50 9.90	+1.183	+22 18 7.7	+0.29	21 10.1
2	5 34 39.70	1.371	22 10 49.2	0.95	22 52.7	2	5 50 38.17	1.173	22 18 14.5	0.27	21 6.7
3	5 35 12.57	1.368	22 11 11.8	0.93	22 49.3	3	5 51 6.22	1.164	22 18 20.8	0.25	21 3.2
4	5 35 45.36	1.364	22 11 33.8	0.91	22 45.9	4	5 51 34.04	1.154	22 18 26.6	0.23	20 59.7
5	5 36 18.05	1.360	22 11 55.3	0.88	22 42.5	5	5 52 1.62	1.144	22 18 32.1	0.22	20 56.2
6	5 36 50.64	+1.356	+22 12 16.1	+0.85	22 39.1	6	5 52 28.96	+1.135	+22 18 37.1	+0.20	20 52.8
7	5 37 23.14	1.352	22 12 36.4	0.83	22 35.7	7	5 52 56.07	1.124	22 18 41.8	0.18	20 49.3
8	5 37 55.54	1.348	22 12 56.1	0.81	22 32.4	8	5 53 22.92	1.113	22 18 46.0	0.17	20 45.8
9	5 38 27.83	1.343	22 13 15.3	0.79	22 29.0	9	5 53 49.52	1.103	22 18 49.8	0.15	20 42.3
10	5 39 0.00	1.338	22 13 33.9	0.76	22 25.6	10	5 54 15.87	1.092	22 18 53.3	0.14	20 38.8
11	5 39 32.06	+1.333	+22 13 52.0	+0.74	22 22.2	11	5 54 41.96	+1.081	+22 18 56.4	+0.12	20 35.3
12	5 40 4.00	1.328	22 14 9.4	0.72	22 18.8	12	5 55 7.78	1.070	22 18 59.1	0.10	20 31.8
13	5 40 35.82	1.323	22 14 26.3	0.69	22 15.4	13	5 55 33.33	1.059	22 19 1.4	0.09	20 28.2
14	5 41 7.50	1.317	22 14 42.7	0.67	22 12.0	14	5 55 58.60	1.047	22 19 3.3	0.07	20 24.7
15	5 41 39.04	1.311	22 14 58.5	0.65	22 8.6	15	5 56 23.60	1.036	22 19 4.9	0.06	20 21.2
16	5 42 10.44	+1.305	+22 15 13.8	+0.62	22 5.1	16	5 56 48.31	+1.024	+22 19 6.2	+0.05	20 17.7
17	5 42 41.70	1.299	22 15 28.5	0.60	22 1.7	17	5 57 12.72	1.011	22 19 7.1	0.03	20 14.1
18	5 43 12.82	1.293	22 15 42.6	0.58	21 58.3	18	5 57 36.84	0.999	22 19 7.7	0.02	20 10.6
19	5 43 43.78	1.287	22 15 56.3	0.56	21 54.9	19	5 58 0.66	0.986	22 19 8.0	+0.01	20 7.1
20	5 44 14.59	1.280	22 16 9.5	0.54	21 51.4	20	5 58 24.18	0.973	22 19 8.0	−0.01	20 3.6
21	5 44 45.23	+1.273	+22 16 22.1	+0.51	21 48.0	21	5 58 47.38	+0.960	+22 19 7.7	−0.02	20 0.0
22	5 45 15.69	1.265	22 16 34.2	0.49	21 44.6	22	5 59 10.27	0.947	22 19 7.1	0.03	19 56.5
23	5 45 45.98	1.258	22 16 45.8	0.47	21 41.2	23	5 59 32.83	0.933	22 19 6.3	0.04	19 52.9
24	5 46 16.09	1.251	22 16 56.8	0.45	21 37.7	24	5 59 55.07	0.919	22 19 5.2	0.05	19 49.3
25	5 46 46.02	1.243	22 17 7.3	0.43	21 34.3	25	6 0 16.98	0.906	22 19 3.8	0.06	19 45.7
26	5 47 15.75	+1.235	+22 17 17.4	+0.41	21 30.8	26	6 0 38.55	+0.892	+22 19 2.1	−0.07	19 42.2
27	5 47 45.29	1.227	22 17 26.9	0.39	21 27.4	27	6 0 59.78	0.878	22 19 0.3	0.08	19 38.6
28	5 48 14.63	1.218	22 17 36.0	0.37	21 23.9	28	6 1 20.67	0.863	22 18 58.3	0.09	19 35.0
29	5 48 43.76	1.209	22 17 44.6	0.35	21 20.5	29	6 1 41.22	0.849	22 18 56.0	0.10	19 31.4
30	5 49 12.69	1.201	22 17 52.7	0.33	21 17.0	30	6 2 1.41	0.834	22 18 53.6	0.11	19 27.8
31	5 49 41.40	+1.192	+22 18 0.4	+0.31	21 13.6	31	6 2 21.24	+0.819	+22 18 50.9	−0.12	19 24.2
32	5 50 9.90	+1.183	+22 18 7.7	+0.29	21 10.1	32	6 2 40.72	+0.804	+22 18 48.1	−0.12	19 20.6

Day of the Month.	4th.	12th.	20th.	28th.	Day of the Month.	5th.	13th.	21st.	29th.
	″	″	″	″		″	″	″	″
Semidiameter . . .	7.76	7.79	7.84	7.90	Semidiameter . . .	7.97	8.05	8.14	8.24
Horizontal Parallax	0.88	0.89	0.89	0.90	Horizontal Parallax	0.91	0.92	0.92	0.94

Note.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

SATURN, 1914.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	6 2 40.72	+0.804	+22 18 48.1	−0.12	19 20.6	1	6 9 18.43	+0.278	+22 16 44.9	−0.16	17 29.0
2	6 2 59.84	0.789	22 18 45.0	0.13	19 16.9	2	6 9 24.88	0.259	22 16 41.0	0.16	17 25.2
3	6 3 18.59	0.773	22 18 41.9	0.13	19 13.3	3	6 9 30.86	0.239	22 16 37.3	0.15	17 21.4
4	6 3 36.97	0.758	22 18 38.6	0.14	19 9.7	4	6 9 36.36	0.219	22 16 33.6	0.15	17 17.5
5	6 3 54.97	0.742	22 18 35.1	0.15	19 6.1	5	6 9 41.40	0.200	22 16 30.1	0.15	17 13.7
6	6 4 12.60	+0.727	+22 18 31.4	−0.15	19 2.4	6	6 9 45.96	+0.180	+22 16 26.6	−0.14	17 9.8
7	6 4 29.85	0.711	22 18 27.7	0.16	18 58.8	7	6 9 50.05	0.161	22 16 23.2	0.14	17 5.9
8	6 4 46.71	0.694	22 18 23.8	0.16	18 55.1	8	6 9 53.66	0.141	22 16 20.0	0.13	17 2.0
9	6 5 3.18	0.678	22 18 19.8	0.17	18 51.4	9	6 9 56.79	0.121	22 16 16.9	0.12	16 58.1
10	6 5 19.25	0.661	22 18 15.8	0.17	18 47.7	10	6 9 59.45	0.101	22 16 14.0	0.12	16 54.2
11	6 5 34.92	+0.645	+22 18 11.7	−0.17	18 44.1	11	6 10 1.63	+0.081	+22 16 11.2	−0.11	16 50.3
12	6 5 50.19	0.628	22 18 7.5	0.18	18 40.4	12	6 10 3.32	0.060	22 16 8.5	0.11	16 46.4
13	6 6 5.05	0.611	22 18 3.2	0.18	18 36.7	13	6 10 4.52	0.040	22 16 6.0	0.11	16 42.5
14	6 6 19.50	0.593	22 17 58.8	0.18	18 33.0	14	6 10 5.24	+0.020	22 16 3.6	0.10	16 38.6
15	6 6 33.53	0.576	22 17 54.4	0.18	18 29.3	15	6 10 5.48	0.000	22 16 1.3	0.09	16 34.7
16	6 6 47.14	+0.558	+22 17 50.0	−0.18	18 25.6	16	6 10 5.24	−0.020	+22 15 59.3	−0.08	16 30.7
17	6 7 0.33	0.541	22 17 45.6	0.18	18 21.9	17	6 10 4.51	0.041	22 15 57.4	0.07	16 26.8
18	6 7 13.09	0.523	22 17 41.1	0.19	18 18.1	18	6 10 3.28	0.061	22 15 55.7	0.07	16 22.8
19	6 7 25.41	0.504	22 17 36.6	0.19	18 14.4	19	6 10 1.57	0.081	22 15 54.1	0.07	16 18.9
20	6 7 37.30	0.486	22 17 32.0	0.19	18 10.6	20	6 9 59.38	0.101	22 15 52.6	0.06	16 14.9
21	6 7 48.74	+0.468	+22 17 27.5	−0.19	18 6.9	21	6 9 56.71	−0.121	+22 15 51.3	−0.05	16 10.9
22	6 7 59.74	0.449	22 17 23.0	0.19	18 3.1	22	6 9 53.55	0.141	22 15 50.3	0.04	16 6.9
23	6 8 10.30	0.431	22 17 18.5	0.19	17 59.4	23	6 9 49.91	0.161	22 15 49.4	0.04	16 2.9
24	6 8 20.42	0.412	22 17 14.1	0.18	17 55.6	24	6 9 45.80	0.181	22 15 48.6	0.03	15 58.9
25	6 8 30.08	0.393	22 17 9.7	0.18	17 51.8	25	6 9 41.22	0.201	22 15 48.1	0.02	15 54.9
26	6 8 39.28	+0.374	+22 17 5.4	−0.18	17 48.0	26	6 9 36.15	−0.221	+22 15 47.7	−0.01	15 50.9
27	6 8 48.03	0.355	22 17 1.2	0.17	17 44.2	27	6 9 30.61	0.241	22 15 47.5	−0.01	15 46.9
28	6 8 56.32	0.336	22 16 57.0	0.17	17 40.4	28	6 9 24.61	0.260	22 15 47.4	0.00	15 42.8
29	6 9 4.15	0.317	22 16 52.9	0.17	17 36.6	29	6 9 18.15	0.279	22 15 47.5	+0.01	15 38.8
30	6 9 11.52	0.298	22 16 48.8	0.17	17 32.8	30	6 9 11.22	0.298	22 15 47.8	0.02	15 34.7
31	6 9 18.43	+0.278	+22 16 44.9	−0.16	17 29.0	31	6 9 3.84	−0.317	+22 15 48.2	+0.02	15 30.7
32	6 9 24.88	+0.259	+22 16 41.0	−0.16	17 25.2	32	6 8 55.99	−0.336	+22 15 48.8	+0.03	15 26.6

Day of the Month.	6th.	14th.	22d.	30th.	Day of the Month.	8th.	16th.	24th.
	″	″	″	″		″	″	″
Semidiameter . . .	8.35	8.47	8.59	8.72	Semidiameter	8.85	8.98	9.11
Horizontal Parallax	0.95	0.96	0.98	0.99	Horizontal Parallax . . .	1.01	1.02	1.03

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	6 8 55.99	−0.336	+22 15 48.8	+0.03	15 26.6
2	6 8 47.69	0.355	22 15 49.6	0.04	15 22.5
3	6 8 38.95	0.373	22 15 50.5	0.04	15 18.4
4	6 8 29.76	0.392	22 15 51.6	0.05	15 14.3
5	6 8 20.13	0.411	22 15 52.8	0.05	15 10.2
6	6 8 10.06	−0.429	+22 15 54.1	+0.06	15 6.1
7	6 7 59.56	0.446	22 15 55.6	0.06	15 2.0
8	6 7 48.63	0.464	22 15 57.2	0.07	14 57.9
9	6 7 37.27	0.482	22 15 59.0	0.07	14 53.8
10	6 7 25.50	0.499	22 16 0.8	0.08	14 49.7
11	6 7 13.31	−0.516	+22 16 2.8	+0.09	14 45.5
12	6 7 0.72	0.533	22 16 4.9	0.09	14 41.4
13	6 6 47.72	0.550	22 16 7.2	0.10	14 37.2
14	6 6 34.32	0.566	22 16 9.6	0.10	14 33.1
15	6 6 20.53	0.582	22 16 12.1	0.11	14 28.9
16	6 6 6.36	−0.598	+22 16 14.7	+0.11	14 24.8
17	6 5 51.81	0.614	22 16 17.4	0.11	14 20.6
18	6 5 36.90	0.629	22 16 20.2	0.12	14 16.4
19	6 5 21.62	0.644	22 16 23.1	0.12	14 12.2
20	6 5 5.99	0.658	22 16 26.1	0.12	14 8.0
21	6 4 50.02	−0.672	+22 16 29.1	+0.13	14 3.8
22	6 4 33.72	0.686	22 16 32.3	0.13	13 59.6
23	6 4 17.09	0.699	22 16 35.5	0.14	13 55.4
24	6 4 0.15	0.712	22 16 38.8	0.14	13 51.2
25	6 3 42.91	0.725	22 16 42.1	0.14	13 47.0
26	6 3 25.37	−0.737	+22 16 45.5	+0.14	13 42.8
27	6 3 7.54	0.748	22 16 48.9	0.14	13 38.5
28	6 2 49.44	0.759	22 16 52.4	0.15	13 34.3
29	6 2 31.07	0.770	22 16 55.9	0.15	13 30.0
30	6 2 12.44	0.781	22 16 59.4	0.15	13 25.8
31	6 1 53.57	−0.791	+22 17 3.0	+0.15	13 21.5
32	6 1 34.46	−0.801	+22 17 6.6	+0.15	13 17.3

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	6 1 53.57	−0.791	+22 17 3.0	+0.15	13 21.5
2	6 1 34.46	0.801	22 17 6.6	0.15	13 17.3
3	6 1 15.12	0.811	22 17 10.2	0.15	13 13.0
4	6 0 55.56	0.819	22 17 13.8	0.15	13 8.8
5	6 0 35.80	0.827	22 17 17.4	0.15	13 4.5
6	6 0 15.85	−0.835	+22 17 21.0	+0.15	13 0.3
7	5 59 55.71	0.843	22 17 24.7	0.15	12 56.0
8	5 59 35.40	0.850	22 17 28.3	0.15	12 51.8
9	5 59 14.92	0.856	22 17 31.9	0.15	12 47.5
10	5 58 54.29	0.862	22 17 35.5	0.15	12 43.2
11	5 58 33.53	−0.868	+22 17 39.1	+0.15	12 38.9
12	5 58 12.64	0.873	22 17 42.7	0.15	12 34.7
13	5 57 51.63	0.878	22 17 46.3	0.15	12 30.4
14	5 57 30.51	0.882	22 17 49.8	0.15	12 26.1
15	5 57 9.30	0.885	22 17 53.4	0.15	12 21.8
16	5 56 48.02	−0.888	+22 17 56.9	+0.15	12 17.5
17	5 56 26.67	0.890	22 18 0.5	0.15	12 13.2
18	5 56 5.27	0.892	22 18 4.0	0.15	12 8.9
19	5 55 43.83	0.893	22 18 7.5	0.15	12 4.6
20	5 55 22.37	0.894	22 18 10.9	0.15	12 0.3
21	5 55 0.90	−0.895	+22 18 14.4	+0.15	11 56.0
22	5 54 39.43	0.894	22 18 17.8	0.15	11 51.7
23	5 54 17.97	0.893	22 18 21.3	0.15	11 47.4
24	5 53 56.54	0.892	22 18 24.7	0.14	11 43.1
25	5 53 35.15	0.890	22 18 28.1	0.14	11 38.8
26	5 53 13.81	−0.888	+22 18 31.4	+0.14	11 34.5
27	5 52 52.53	0.885	22 18 34.8	0.14	11 30.3
28	5 52 31.33	0.881	22 18 38.2	0.14	11 26.0
29	5 52 10.22	0.877	22 18 41.5	0.14	11 21.7
30	5 51 49.21	0.873	22 18 44.8	0.14	11 17.4
31	5 51 28.31	−0.868	+22 18 48.2	+0.14	11 13.2
32	5 51 7.53	−0.863	+22 18 51.5	+0.14	11 8.9

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter . . .	9.23	9.34	9.44	9.52
Horizontal Parallax	1.05	1.06	1.07	1.08

Day of the Month.	3d.	11th.	19th.	27th.	35th.
	″	″	″	″	″
Semidiameter . .	9.58	9.63	9.64	9.64	9.61
Horizontal Parallax	1.09	1.09	1.10	1.09	1.09

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 1	20 34 19.92	+13.320	−19 20 55.1	+48.80	1 52.9	July 4	20 53 33.88	− 8.012	−18 11 33.2	−33.88	14 4.6
5	20 35 13.80	13.610	19 17 37.4	50.02	1 38.0	8	20 53 0.99	8.426	18 13 51.6	35.30	13 48.3
9	20 36 8.74	13.851	19 14 15.2	51.07	1 23.2	12	20 52 26.54	8.790	18 16 15.2	36.50	13 31.9
13	20 37 4.55	14.047	19 10 49.1	51.96	1 8.4	16	20 51 50.74	9.101	18 18 43.3	37.50	13 15.6
17	20 38 1.06	14.200	19 7 19.7	52.70	0 53.6	20	20 51 13.81	9.352	18 21 14.9	38.26	12 59.3
21	20 38 58.09	+14.306	−19 3 47.7	+53.26	0 38.8	24	20 50 36.01	− 9.538	−18 23 49.0	−38.74	12 43.0
25	20 39 55.44	14.359	19 0 13.9	53.63	0 24.1	28	20 49 57.59	9.660	18 26 24.4	38.92	12 26.6
29	20 40 52.89	14.358	18 56 38.9	53.83	0 9.3	Aug. 1	20 49 18.81	9.719	18 29 0.0	38.84	12 10.3
Feb. 2	20 41 50.24	14.308	18 53 3.5	53.83	23 50.8	5	20 48 39.92	9.717	18 31 34.8	38.53	11 53.9
6	20 42 47.29	14.211	18 49 28.5	53.64	23 36.0	9	20 48 1.16	9.652	18 34 7.9	37.98	11 37.5
10	20 43 43.86	+14.068	−18 45 54.6	+53.27	23 21.2	13	20 47 22.79	− 9.523	−18 36 38.3	−37.19	11 21.1
14	20 44 39.77	13.879	18 42 22.6	52.71	23 6.4	17	20 46 45.06	9.330	18 39 5.1	36.16	11 4.7
18	20 45 34.83	13.646	18 38 53.2	51.97	22 51.6	21	20 46 8.23	9.074	18 41 27.3	34.88	10 48.4
22	20 46 28.88	13.369	18 35 27.1	51.04	22 36.9	25	20 45 32.55	8.756	18 43 43.8	33.36	10 32.1
26	20 47 21.72	13.044	18 32 5.1	49.92	22 22.2	29	20 44 58.26	8.377	18 45 53.9	31.64	10 15.8
Mar. 2	20 48 13.17	+12.673	−18 28 48.0	+48.60	22 7.2	Sept. 2	20 44 25.61	− 7.941	−18 47 56.7	−29.73	9 59.5
6	20 49 3.05	12.260	18 25 36.5	47.09	21 52.2	6	20 43 54.80	7.454	18 49 51.5	27.65	9 43.3
10	20 49 51.20	11.809	18 22 31.5	45.41	21 37.2	10	20 43 26.04	6.919	18 51 37.7	25.42	9 27.1
14	20 50 37.47	11.323	18 19 33.5	43.58	21 22.3	14	20 42 59.51	6.339	18 53 14.6	23.02	9 11.0
18	20 51 21.73	10.800	18 16 43.1	41.59	21 7.3	18	20 42 35.39	5.712	18 54 41.6	20.45	8 54.8
22	20 52 3.82	+10.239	−18 14 1.0	+39.42	20 52 .2	22	20 42 13.87	− 5.039	−18 55 58.0	−17.74	8 38.7
26	20 52 43.60	9.643	18 11 28.0	37.07	20 37.1	26	20 41 55.13	4.328	18 57 3.4	14.92	8 22.7
30	20 53 20.92	9.014	18 9 4.7	34.56	20 22.0	30	20 41 39.29	3.589	18 57 57.3	12.02	8 6.7
Apr. 3	20 53 55.67	8.357	18 6 51.7	31.92	20 6.8	Oct. 4	20 41 26.45	2.827	18 58 39.5	9.06	7 50.8
7	20 54 27.74	7.675	18 4 49.5	29.18	19 51.6	8	20 41 16.70	2.043	18 59 9.7	6.03	7 34.9
11	20 54 57.04	+ 6.972	−18 2 58.4	+26.33	19 36.4	12	20 41 10.13	− 1.240	−18 59 27.7	− 2.94	7 19.1
15	20 55 23.49	6.248	18 1 19.0	23.38	19 21.1	16	20 41 6.80	− 0.420	18 59 33.2	+ 0.20	7 3.3
19	20 55 47.00	5.500	17 59 51.6	20.33	19 5.7	20	20 41 6.78	+ 0.414	18 59 26.1	3.36	6 47.6
23	20 56 7.47	4.731	17 58 36.5	17.19	18 50.3	24	20 41 10.12	1.254	18 59 6.3	6.54	6 31.9
27	20 56 24.83	3.948	17 57 34.2	13.96	18 34.9	28	20 41 16.81	2.092	18 58 33.8	9.72	6 16.3
May 1	20 56 39.04	+ 3.157	−17 56 44.9	+10.69	18 19.4	Nov. 1	20 41 26.84	+ 2.922	−18 57 48.6	+12.87	6 0.7
5	20 56 50.08	2.363	17 56 8.7	7.42	18 3.8	5	20 41 40.17	3.742	18 56 50.9	15.97	5 45.2
9	20 56 57.94	1.566	17 55 45.6	4.13	17 48.2	9	20 41 56.76	4.553	18 55 40.9	19.03	5 29.8
13	20 57 2.61	+ 0.768	17 55 35.7	+ 0.84	17 32.5	13	20 42 16.58	5.352	18 54 18.7	22.06	5 14.4
17	20 57 4.08	− 0.030	17 55 38.9	− 2.43	17 16.8	17	20 42 39.56	6.135	18 52 44.5	25.05	4 59.1
21	20 57 2.37	− 0.824	−17 55 55.1	− 5.68	17 1.1	21	20 43 5.63	+ 6.897	−18 50 58.4	+27.98	4 43.8
25	20 56 57.50	1.610	17 56 24.3	8.89	16 45.3	25	20 43 34.70	7.632	18 49 0.7	30.82	4 28.5
29	20 56 49.51	2.381	17 57 6.2	12.03	16 29.4	29	20 44 6.65	8.334	18 46 52.0	33.54	4 13.3
June 2	20 56 38.48	3.130	17 58 0.4	15.06	16 13.5	Dec. 3	20 44 41.33	9.002	18 44 32.6	36.14	3 58.2
6	20 56 24.50	3.854	17 59 6.5	17.96	15 57.5	7	20 45 18.62	9.640	18 42 3.0	38.64	3 43.1
10	20 56 7.68	− 4.553	−18 0 23.9	−20.72	15 41.5	11	20 45 58.41	+10.247	−18 39 23.6	+41.04	3 28.0
14	20 55 48.12	5.225	18 1 52.1	23.36	15 25.4	15	20 46 40.55	10.817	18 36 34.8	43.33	3 13.0
18	20 55 25.92	5.867	18 3 30.6	25.86	15 9.3	19	20 47 24.89	11.345	18 33 37.1	45.49	2 58.0
22	20 55 1.23	6.472	18 5 18.8	28.18	14 53.2	23	20 48 11.25	11.828	18 30 31.1	47.49	2 43.0
26	20 54 34.20	7.034	18 7 15.8	30.30	14 37.0	27	20 48 59.45	12.265	18 27 17.4	49.31	2 28.1
30	20 54 5.02	− 7.548	−18 9 20.9	−32.21	14 20.8	31	20 49 49.31	+12.659	−18 23 56.8	+50.97	2 13.2
July 4	20 53 33.88	− 8.012	−18 11 33.2	−33.88	14 4.6	35	20 50 40.67	+13.010	−18 20 29.8	+52.48	1 58.3

Least semidiameter,	January 29,	1″.61	Least horizontal parallax,	January 29,	0″.42
Greatest semidiameter,	August 1,	1″.78	Greatest horizontal parallax,	August 1,	0″.47

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 1	7 57 4.23	−6.701	+20 16 24.2	+19.10	13 13.7	July 4	7 57 13.53	+9.039	+20 19 37.8	−24.39	1 10.4
5	7 56 37.08	6.867	20 17 41.5	19.57	12 57.5	8	7 57 49.97	9.152	20 17 59.2	24.88	0 55.3
9	7 56 9.35	6.986	20 19 0.5	19.90	12 41.3	12	7 58 26.76	9.237	20 16 18.8	25.30	0 40.2
13	7 55 41.24	7.062	20 20 20.6	20.09	12 25.1	16	7 59 3.83	9.292	20 14 36.9	25.64	0 25.1
17	7 55 12.91	7.095	20 21 41.1	20.17	12 8.9	20	7 59 41.06	9.316	20 12 53.8	25.90	0 10.0
21	7 54 44.54	−7.081	+20 23 1.8	+20.13	11 52.7	24	8 0 18.31	+9.308	+20 11 9.9	−26.06	23 51.1
25	7 54 16.33	7.019	20 24 22.0	19.96	11 36.5	28	8 0 55.47	9.263	20 9 25.5	26.11	23 36.0
29	7 53 48.45	6.910	20 25 41.3	19.66	11 20.3	Aug. 1	8 1 32.38	9.188	20 7 41.1	26.06	23 20.8
Feb. 2	7 53 21.11	6.752	20 26 59.1	19.22	11 4.1	5	8 2 8.93	9.083	20 5 57.1	25.94	23 5.7
6	7 52 54.49	6.551	20 28 15.0	18.67	10 48.0	9	8 2 45.00	8.949	20 4 13.7	25.73	22 50.6
10	7 52 28.76	−6.310	+20 29 28.4	+18.02	10 31.8	13	8 3 20.48	+8.786	+20 2 31.4	−25.42	22 35.4
14	7 52 4.06	6.031	20 30 38.9	17.27	10 15.7	17	8 3 55.25	8.592	20 0 50.5	25.01	22 20.3
18	7 51 40.56	5.714	20 31 46.4	16.43	9 59.6	21	8 4 29.17	8.366	19 59 11.4	24.50	22 5.1
22	7 51 18.40	5.359	20 32 50.2	15.48	9 43.5	25	8 5 2.13	8.108	19 57 34.6	23.89	21 49.9
26	7 50 57.73	4.967	20 33 50.1	14.46	9 27.4	29	8 5 34.00	7.821	19 56 0.4	23.16	21 34.7
Mar. 2	7 50 38.70	−4.544	+20 34 45.8	+13.34	9 11.4	Sept. 2	8 6 4.67	+7.507	+19 54 29.4	−22.35	21 19.5
6	7 50 21.42	4.093	20 35 36.8	12.15	8 55.3	6	8 6 34.03	7.169	19 53 1.7	21.47	21 4.3
10	7 50 5.99	3.619	20 36 23.0	10.92	8 39.4	10	8 7 1.99	6.805	19 51 37.7	20.49	20 49.0
14	7 49 52.49	3.126	20 37 4.1	9.64	8 23.4	14	8 7 28.44	6.416	19 50 17.9	19.41	20 33.7
18	7 49 41.00	2.613	20 37 40.0	8.31	8 7.5	18	8 7 53.28	6.000	19 49 2.6	18.24	20 18.4
22	7 49 31.60	−2.083	+20 38 10.4	+ 6.93	7 51.6	22	8 8 16.41	+5.559	+19 47 52.1	−16.97	20 3.0
26	7 49 24.36	1.537	20 38 35.4	5.52	7 35.8	26	8 8 37.73	5.096	19 46 46.9	15.63	19 47.7
30	7 49 19.32	0.980	20 38 54.6	4.07	7 20.0	30	8 8 57.16	4.616	19 45 47.2	14.22	19 32.3
Apr. 3	7 49 16.52	−0.418	20 39 7.9	2.60	7 4.2	Oct. 4	8 9 14.63	4.119	19 44 53.2	12.75	19 16.8
7	7 49 15.97	+0.145	20 39 15.4	+ 1.14	6 48.5	8	8 9 30.09	3.607	19 44 5.3	11.21	19 1.3
11	7 49 17.68	+0.707	+20 39 17.0	− 0.33	6 32.8	12	8 9 43.46	+3.078	+19 43 23.6	− 9.62	18 45.8
15	7 49 21.63	1.267	20 39 12.7	1.80	6 17.1	16	8 9 54.70	2.536	19 42 48.4	7.98	18 30.2
19	7 49 27.82	1.826	20 39 2.6	3.26	6 1.5	20	8 10 3.73	1.980	19 42 19.9	6.27	18 14.6
23	7 49 36.23	2.379	20 38 46.6	4.73	5 45.9	24	8 10 10.53	1.418	19 41 58.3	4.53	17 59.0
27	7 49 46.84	2.923	20 38 24.8	6.18	5 30.4	28	8 10 15.08	0.854	19 41 43.6	2.79	17 43.4
May 1	7 49 59.60	+3.455	+20 37 57.2	− 7.61	5 14.9	Nov. 1	8 10 17.36	+0.288	+19 41 35.9	− 1.04	17 27.7
5	7 50 14.46	3.970	20 37 23.9	9.02	4 59.4	5	8 10 17.39	−0.278	19 41 35.3	+ 0.71	17 12.0
9	7 50 31.34	4.469	20 36 45.1	10.39	4 43.9	9	8 10 15.16	0.839	19 41 41.7	2.47	16 56.2
13	7 50 50.19	4.950	20 36 0.9	11.71	4 28.5	13	8 10 10.68	1.398	19 41 55.1	4.21	16 40.4
17	7 51 10.92	5.414	20 35 11.5	13.01	4 13.1	17	8 10 3.98	1.949	19 42 15.4	5.95	16 24.5
21	7 51 33.48	+5.860	+20 34 17.0	−14.27	3 57.8	21	8 9 55.11	−2.486	+19 42 42.5	+ 7.63	16 8.7
25	7 51 57.77	6.283	20 33 17.4	15.50	3 42.5	25	8 9 44.12	3.007	19 43 16.3	9.25	15 52.8
29	7 52 23.71	6.683	20 32 13.1	16.67	3 27.2	29	8 9 31.09	3.505	19 43 56.4	10.79	15 36.8
June 2	7 52 51.19	7.052	20 31 4.2	17.78	3 11.9	Dec. 3	8 9 16.11	3.982	19 44 42.6	12.28	15 20.8
6	7 53 20.10	7.397	20 29 50.9	18.82	2 56.6	7	8 8 59.27	4.435	19 45 34.6	13.68	15 4.8
10	7 53 50.33	+7.716	+20 28 33.6	−19.81	2 41.4	11	8 8 40.66	−4.863	+19 46 32.0	+15.00	14 48.8
14	7 54 21.79	8.010	20 27 12.5	20.75	2 26.2	15	8 8 20.40	5.262	19 47 34.6	16.24	14 32.7
18	7 54 54.37	8.277	20 25 47.7	21.63	2 11.0	19	8 7 58.61	5.625	19 48 41.8	17.36	14 16.6
22	7 55 27.96	8.514	20 24 19.5	22.43	1 55.9	23	8 7 35.45	5.950	19 49 53.3	18.35	14 0.5
26	7 56 2.45	8.721	20 22 48.3	23.17	1 40.7	27	8 7 11.07	6.234	19 51 8.4	19.21	13 44.4
30	7 56 37.70	+8.896	+20 21 14.3	−23.82	1 25.6	31	8 6 45.63	−6.477	+19 52 26.8	+19.94	13 28.2
July 4	7 57 13.58	+9.039	+20 19 37.8	−24.39	1 10.4	35	8 6 19.29	−6.682	+19 53 47.8	+20.55	13 12.0

Greatest semidiameter,	January 17, 1″.33	Greatest horizontal parallax,	January 17, 0″.30
Least semidiameter,	July 20, 1″.25	Least horizontal parallax,	July 20, 0″.28

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 0	233 8 6.3	2 50 54.0	+ 2 36.5	−0 42 50.6	−20 52.9	9.660 2318	0.127 5788	0.129 1068
1	235 58 12.7	2 49 21.1	3 50.7	1 3 33.9	20 33.5	9.662 2495	0.130 5835	0.132 0098
2	238 46 53.1	2 48 1.9	5 2.0	1 23 57.3	20 13.0	9.664 0030	0.133 3865	0.134 7142
3	241 34 21.1	2 46 56.2	6 10.0	1 43 59.6	19 51.4	9.665 4936	0.135 9939	0.137 2263
4	244 20 49.8	2 46 3.5	7 14.0	2 3 39.7	19 28.7	9.666 7220	0.138 4119	0.139 5515
5	247 6 32.2	2 45 23.5	+ 8 13.6	−2 22 56.6	−19 5.0	9.667 6889	0.140 6455	0.141 6946
6	249 51 40.9	2 44 56.1	9 8.5	2 41 49.2	18 40.2	9.668 3949	0.142 6992	0.143 6597
7	252 36 28.5	2 44 41.1	9 58.1	3 0 16.6	18 14.4	9.668 8404	0.144 5767	0.145 4505
8	255 21 7.2	2 44 38.4	10 42.2	3 18 17.6	17 47.4	9.669 0259	0.146 2815	0.147 0702
9	258 5 49.3	2 44 47.9	11 20.4	3 35 51.1	17 19.3	9.668 9514	0.147 8167	0.148 5214
10	260 50 47.0	2 45 9.6	+11 52.3	−3 52 55.9	−16 50.0	9.668 6169	0.149 1846	0.149 8064
11	263 36 12.5	2 45 43.5	12 17.7	4 9 30.7	16 19.4	9.668 0222	0.150 3870	0.150 9265
12	266 22 18.0	2 46 29.7	12 36.3	4 25 34.1	15 47.2	9.667 1669	0.151 4251	0.151 8829
13	269 9 16.0	2 47 28.4	12 47.9	4 41 4.5	15 13.4	9.666 0503	0.152 2999	0.152 6760
14	271 57 19.1	2 48 39.8	12 52.3	4 56 0.4	14 37.9	9.664 6718	0.153 0112	0.153 3055
15	274 46 40.0	2 50 4.1	+12 49.2	−5 10 19.8	−14 0.5	9.663 0306	0.153 5589	0.153 7711
16	277 37 31.7	2 51 41.5	12 38.5	5 24 0.7	13 20.9	9.661 1258	0.153 9420	0.154 0715
17	280 30 7.6	2 53 32.6	12 20.1	5 37 0.9	12 39.0	9.658 9564	0.154 1591	0.154 2046
18	283 24 41.5	2 55 37.6	11 54.0	5 49 17.9	11 54.5	9.656 5213	0.154 2078	0.154 1683
19	286 21 27.6	2 57 56.9	11 20.1	6 0 49.0	11 7.2	9.653 8197	0.154 0856	0.153 9594
20	289 20 40.3	3 0 31.1	+10 38.4	−6 11 31.2	−10 16.7	9.650 8507	0.153 7891	0.153 5742
21	292 22 34.9	3 3 20.7	9 49.1	6 21 21.2	9 22.7	9.647 6134	0.153 3142	0.153 0084
22	295 27 27.0	3 6 26.3	8 52.2	6 30 15.4	8 25.0	9.644 1074	0.152 6561	0.152 2567
23	298 35 33.0	3 9 48.5	7 48.1	6 38 9.8	7 23.0	9.640 3326	0.151 8093	0.151 3133
24	301 47 9.7	3 13 27.9	6 37.1	6 44 59.9	6 16.4	9.636 2895	0.150 7677	0.150 1717
25	305 2 34.8	3 17 25.3	+ 5 19.7	−6 50 41.0	− 5 4.8	9.631 9789	0.149 5241	0.148 8240
26	308 22 6.5	3 21 41.4	3 56.4	6 55 7.7	3 47.8	9.627 4027	0.148 0703	0.147 2618
27	311 46 3.9	3 26 16.8	2 28.0	6 58 14.5	2 24.8	9.622 5637	0.146 3974	0.145 4758
28	315 14 46.8	3 31 12.3	+ 0 55.4	6 59 55.1	− 0 55.3	9.617 4660	0.144 4955	0.143 4552
29	318 48 35.5	3 36 28.5	− 0 40.2	7 0 2.8	+ 0 41.1	9.612 1152	0.142 3534	0.141 1885
30	322 27 51.0	3 42 6.1	− 2 17.6	−6 58 30.5	+ 2 24.8	9.606 5187	0.139 9589	0.138 6630
31	326 12 55.1	3 48 5.6	3 55.3	6 55 10.6	4 16.4	9.600 6862	0.137 2988	0.135 8644
Feb. 1	330 4 9.9	3 54 27.5	5 31.5	6 49 55.0	6 16.2	9.594 6302	0.134 3578	0.132 7771
2	334 1 57.7	4 1 11.9	7 4.3	6 42 35.4	8 24.5	9.588 3664	0.131 1201	0.129 3846
3	338 6 41.2	4 8 18.8	8 31.3	6 33 3.2	10 41.4	9.581 9138	0.127 5682	0.125 6687
4	342 18 42.7	4 15 47.9	− 9 50.2	−6 21 9.7	+13 7.0	9.575 2958	0.123 6836	0.121 6102
5	346 38 24.1	4 23 38.4	10 58.3	6 6 46.4	15 41.0	9.568 5407	0.119 4459	0.117 1880
6	351 6 6.2	4 31 49.0	11 52.9	5 49 45.2	18 22.7	9.561 6823	0.114 8337	0.112 3802
7	355 42 8.3	4 40 18.1	12 31.2	5 29 58.8	21 11.1	9.554 7605	0.109 8246	0.107 1630
8	0 26 47.6	4 49 3.0	12 50.5	5 7 21.2	24 4.9	9.547 8215	0.104 3951	0.101 5150
9	5 20 18.3	4 58 0.2	−12 48.3	−4 41 47.9	+27 2.0	9.540 9188	0.098 5207	0.095 4092
10	10 22 50.7	5 7 5.5	12 22.7	4 13 17.1	29 59.5	9.534 1134	0.092 1775	0.088 8225
11	15 34 30.3	5 16 13.7	11 32.2	3 41 50.0	32 54.0	9.527 4734	0.085 3413	0.081 7310
12	20 55 16.8	5 25 18.1	10 16.4	3 7 31.6	35 41.3	9.521 0733	0.077 9889	0.074 1124
13	26 25 2.6	5 34 11.0	8 36.1	2 30 31.4	38 16.6	9.514 9939	0.070 0990	0.065 9464
14	32 3 32.0	5 42 43.7	− 6 33.3	−1 51 4.1	+40 34.5	9.509 3207	0.061 6528	0.057 2164
15	37 50 20.1	5 50 46.7	− 4 11.7	−1 9 30.1	+42 29.0	9.504 1413	0.052 6360	0.047 9106

[Eph 14]

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Feb. 15	37 50 20.1	5 50 46.7	− 4 11.7	−1 9 30.1	+42 29.0	9.504 1413	0.052 6360	0.047 9106
16	43 44 52.0	5 58 9.5	− 1 36.2	−0 26 15.7	43 54.5	9.499 5430	0.043 0396	0.038 0229
17	49 46 22.4	6 4 41.6	+ 1 6.5	+0 18 7.3	44 45.4	9.495 6096	0.032 8610	0.027 5548
18	55 53 55.1	6 10 12.5	3 48.8	1 3 2.0	44 57.0	9.492 4177	0.022 1059	0.016 5166
19	62 6 23.9	6 14 32.3	6 22.6	1 47 47.3	44 26.2	9.490 0332	0.010 7898	0.004 9292
20	68 22 33.4	6 17 32.6	+ 8 39.5	+2 31 40.0	+43 11.6	9.488 5073	9.998 9392	9.992 8251
21	74 41 0.6	6 19 6.8	10 32.0	3 13 56.2	41 13.5	9.487 8738	9.986 5929	9.980 2494
22	81 0 17.3	6 19 11.2	11 53.9	3 53 53.5	38 34.5	9.488 1469	9.973 8023	9.967 2602
23	87 18 52.9	6 17 44.5	12 41.1	4 30 53.3	35 19.5	9.489 3203	9.960 6326	9.953 9299
24	93 35 16.8	6 14 48.5	12 51.4	5 4 22.6	31 34.7	9.491 3679	9.947 1634	9.940 3450
25	99 48 1.9	6 10 28.0	+12 25.3	+5 33 55.0	+27 27.3	9.494 2452	9.933 4874	9.926 6042
26	105 55 47.2	6 4 50.4	11 25.5	5 59 11.9	23 5.2	9.497 8919	9.919 7100	9.912 8200
27	111 57 20.2	5 58 5.1	9 56.4	6 20 2.9	18 36.6	9.502 2351	9.905 9500	9.899 1161
28	117 51 38.5	5 50 22.8	8 3.6	6 36 25.2	14 8.7	9.507 1934	9.892 3353	9.885 6251
Mar. 1	123 37 50.7	5 41 55.0	5 53.8	6 48 22.6	9 47.8	9.512 6805	9.879 0035	9.872 4885
2	129 15 17.2	5 32 53.3	+ 3 33.6	+6 56 4.8	+ 5 39.0	9.518 6086	9.866 0983	9.859 8512
3	134 43 29.7	5 23 28.8	+ 1 9.4	6 59 45.8	+ 1 46.1	9.524 8909	9.853 7654	9.847 8591
4	140 2 10.6	5 13 51.7	− 1 13.0	6 59 43.1	− 1 48.2	9.531 4447	9.842 1501	9.836 6556
5	145 11 11.9	5 4 11.1	3 28.8	6 56 16.0	5 2.5	9.538 1929	9.831 3924	9.826 3764
6	150 10 34.0	4 54 34.5	5 34.1	6 49 44.8	7 56.4	9.545 0645	9.821 6224	9.817 1444
7	155 0 24.2	4 45 8.3	− 7 25.8	+6 40 29.8	−10 30.1	9.551 9958	9.812 9550	9.809 0654
8	159 40 55.6	4 35 57.6	9 2.1	6 28 51.1	12 44.2	9.558 9306	9.805 4854	9.802 2232
9	164 12 25.8	4 27 6.2	10 21.7	6 15 7.6	14 39.9	9.565 8196	9.799 2852	9.796 6762
10	168 35 15.5	4 18 37.1	11 24.2	5 59 37.0	16 18.7	9.572 6203	9.794 3992	9.792 4553
11	172 49 48.0	4 30 32.0	12 9.5	5 42 35.4	17 42.1	9.579 2966	9.790 8440	9.789 5630
12	176 56 27.9	4 2 52.1	−12 38.2	+5 24 17.5	−18 51.6	9.585 8183	9.788 6086	9.787 9752
13	180 55 40.9	3 55 38.1	12 51.3	5 4 56.4	19 48.6	9.592 1599	9.787 6558	9.787 6423
14	184 47 52.8	3 48 50.0	12 49.7	4 44 43.9	20 34.6	9.598 3006	9.787 9253	9.788 4942
15	188 33 29.5	3 42 27.6	12 34.6	4 23 50.3	21 11.0	9.604 2236	9.789 3378	9.790 4440
16	192 12 56.4	3 36 30.3	12 7.5	4 2 24.6	21 39.1	9.609 9154	9.791 8004	9.793 3939
17	195 46 38.3	3 30 57.5	−11 29.7	+3 40 34.6	−21 59.8	9.615 3652	9.795 2114	9.797 2394
18	199 14 59.3	3 25 48.3	10 42.6	3 18 27.2	22 14.0	9.620 5645	9.799 4644	9.801 8733
19	202 38 22.6	3 21 1.9	9 47.4	2 56 8.4	22 22.8	9.625 5071	9.804 4530	9.807 1905
20	205 57 10.5	3 16 37.3	8 45.4	2 33 43.1	22 26.9	9.630 1884	9.810 0735	9.813 0898
21	209 11 44.2	3 12 33.5	7 37.9	2 11 15.9	22 26.9	9.634 6050	9.816 2277	9.819 4761
22	212 22 24.1	3 8 49.6	− 6 26.0	+1 48 50.5	−22 23.3	9.638 7548	9.822 8244	9.826 2626
23	215 29 29.7	3 5 24.8	5 10.8	1 26 30.3	22 16.7	9.642 6364	9.829 7812	9.833 3711
24	218 33 19.7	3 2 18.1	3 53.3	1 4 18.0	22 7.5	9.646 2494	9.837 0239	9.840 7316
25	221 34 11.8	2 59 28.8	2 34.4	0 42 16.0	21 56.0	9.649 5936	9.844 4868	9.848 2825
26	224 32 23.0	2 56 56.2	− 1 15.0	+0 20 26.6	21 42.5	9.652 6694	9.852 1124	9.855 9706
27	227 28 9.5	2 54 39.4	+ 0 4.2	−0 1 8.4	−21 27.2	9.655 4773	9.859 8515	9.863 7500
28	230 21 46.9	2 52 38.0	1 22.3	0 22 27.4	21 10.4	9.658 0182	9.867 6617	9.871 5822
29	233 13 30.3	2 50 51.3	2 38.8	0 43 28.9	20 52.3	9.660 2931	9.875 5074	9.879 4338
30	236 3 34.1	2 49 18.7	3 52.9	1 4 11.7	20 33.0	9.662 3030	9.883 3583	9.887 2777
31	238 52 12.2	2 47 59.9	5 4.2	1 24 34.5	20 12.4	9.664 0489	9.891 1894	9.895 0911
Apr. 1	241 39 38.3	2 46 54.5	+ 6 12.0	−1 44 36.1	−19 50.7	9.665 5316	9.898 9804	9.902 8554
2	244 26 5.6	2 46 2.2	+ 7 15.9	−2 4 15.5	−19 28.0	9.666 7521	9.906 7143	9.910 5554

MERCURY.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance f Earth—	
								At Date.	At Inter diate Da
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr.	1	241 39 38.3	2 46 54.5	+ 6 12.0	−1 44 36.1	−19 50.7	9.665 5316	9.898 9804	9.902 8
	2	244 26 5.6	2 46 2.2	7 15.9	2 4 15.5	19 28.0	9.666 7521	9.906 7143	9.910 5
	3	247 11 47.0	2 45 22.6	8 15.4	2 23 31.7	19 4.2	9.667 7112	9.914 3774	9.918 1
	4	249 56 55.1	2 44 55.6	9 10.1	2 42 23.6	18 39.4	9.668 4095	9.921 9588	9.925 7
	5	252 41 42.3	2 44 41.0	9 59.6	3 0 50.2	18 13.6	9.668 8474	9.929 4503	9.933 1
	6	255 26 21.0	2 44 38.6	+10 43.5	−3 18 50.4	−17 46.6	9.669 0252	9.936 8457	9.940 5
	7	258 11 3.5	2 44 48.4	11 21.4	3 36 23.1	17 18.5	9.668 9430	9.944 1395	9.947 74
	8	260 56 1.9	2 45 10.5	11 53.2	3 53 27.0	16 49.1	9.668 6007	9.951 3281	9.954 88
	9	263 41 28.5	2 45 44.8	12 18.4	4 10 0.8	16 18.4	9.667 9982	9.958 4089	9.961 9
	10	266 27 35.5	2 46 31.3	12 36.8	4 26 3.2	15 46.2	9.667 1351	9.965 3803	9.968 8
	11	269 14 35.3	2 47 30.4	+12 48.2	−4 41 32.6	−15 12.4	9.666 0108	9.972 2411	9.975 6
	12	272 2 40.6	2 48 42.2	12 52.3	4 56 27.4	14 36.8	9.664 6245	9.978 9901	9.982 32
	13	274 52 4.1	2 50 6.9	12 49.0	5 10 45.6	13 59.3	9.662 9754	9.985 6273	9.988 9
	14	277 42 58.8	2 51 44.8	12 38.1	5 24 25.3	13 19.7	9.661 0626	9.992 1526	9.995 37
	15	280 35 38.2	2 53 36.2	12 19.5	5 37 24.2	12 37.7	9.658 8853	9.998 5659	0.001 73
	16	283 30 15.9	2 55 41.6	+11 53.1	−5 49 39.9	−11 53.1	9.656 4423	0.004 8672	0.007 97
	17	286 27 6.2	2 58 1.3	11 18.9	6 1 9.5	11 5.7	9.653 7327	0.011 0562	0.014 10
	18	289 26 23.6	3 0 36.0	10 37.0	6 11 50.1	10 15.1	9.650 7556	0.017 1330	0.020 12
	19	292 28 23.4	3 3 26.1	9 47.4	6 21 38.5	9 21.0	9.647 5102	0.023 0972	0.026 03
	20	295 33 21.2	3 6 32.1	8 50.3	6 30 31.0	8 23.1	9.643 9961	0.028 9483	0.031 83
	21	298 41 33.3	3 9 54.8	+ 7 46.0	−6 38 23.4	− 7 21.0	9.640 2132	0.034 6849	0.037 51
	22	301 53 16.7	3 13 34.8	6 34.8	6 45 11.4	6 14.3	9.636 1619	0.040 3059	0.043 072
	23	305 8 49.0	3 17 32.8	5 17.2	6 50 50.3	5 2.6	9.631 8432	0.045 8091	0.048 5
	24	308 28 28.5	3 21 49.4	3 53.7	6 55 14.7	3 45.3	9.627 2590	0.051 1921	0.053 837
	25	311 52 34.3	3 26 25.5	2 25.2	6 58 18.9	2 22.1	9.622 4121	0.056 4516	0.059 033
	26	315 21 26.2	3 31 21.7	+ 0 52.6	−6 59 56.7	− 0 52.5	9.617 3066	0.061 5836	0.064 100
	27	318 55 24.5	3 36 38.5	− 0 43.1	7 0 1.5	+ 0 44.1	9.611 9481	0.066 5834	0.069 032
	28	322 34 50.3	3 42 16.7	2 20.6	6 58 26.0	2 28.1	9.606 3443	0.071 4455	0.073 822
	29	326 20 5.3	3 48 17.0	3 58.3	6 55 2.7	4 19.9	9.600 5049	0.076 1630	0.078 465
	30	330 11 31.7	3 54 39.6	5 34.4	6 49 43.4	6 20.0	9.594 4424	0.080 7282	0.082 951
May	1	334 9 31.9	4 1 24.6	− 7 7.0	−6 42 19.9	+ 8 28.6	9.588 1724	0.085 1322	0.087 270
	2	338 14 28.4	4 8 32.1	8 33.8	6 32 43.5	10 45.8	9.581 7143	0.089 3649	0.091 413
	3	342 26 43.6	4 16 1.9	9 52.4	6 20 45.5	13 11.6	9.575 0916	0.093 4150	0.095 367
	4	346 46 39.3	4 23 53.0	11 0.2	6 6 17.5	15 45.7	9.568 3327	0.097 2691	0.099 118
	5	351 14 36.3	4 32 4.3	11 54.3	5 49 11.4	18 27.7	9.561 4717	0.100 9133	0.102 651
	6	355 50 54.0	4 40 33.9	−12 32.0	−5 29 19.8	+21 16.5	9.554 5486	0.104 3319	0.105 951
	7	0 35 49.3	4 49 19.2	12 50.7	5 6 36.8	24 10.4	9.547 6098	0.107 5071	0.108 997
	8	5 29 36.4	4 58 16.8	12 47.9	4 40 58.1	27 7.4	9.540 7091	0.110 4201	0.111 772
	9	10 32 25.5	5 7 22.4	12 21.5	4 12 21.9	30 4.8	9.533 9076	0.113 0511	0.114 2541
	10	15 44 22.0	5 16 30.5	11 30.2	3 40 49.5	32 59.2	9.527 2735	0.115 3785	0.116 421
	11	21 5 25.1	5 25 34.5	−10 13.7	−3 6 26.0	+35 46.3	9.520 8818	0.117 3804	0.118 252
	12	26 35 27.1	5 34 26.9	8 32.7	2 29 21.0	38 21.2	9.514 8135	0.119 0335	0.119 7220
	13	32 14 12.2	5 42 59.0	6 29.3	1 49 49.5	40 38.4	9.509 1539	0.120 3149	0.120 8094
	14	38 1 15.1	5 51 0.9	4 7.1	1 8 12.1	42 32.1	9.503 9908	0.121 2027	0.121 4920
	15	43 56 0.6	5 58 22.4	− 1 31.3	−0 24 55.1	43 56.6	9.499 4115	0.121 6749	0.121 7490
	16	49 57 43.0	6 4 52.8	+ 1 11.5	+0 19 29.5	+44 46.4	9.495 4996	0.121 7121	0.121 5620
	17	56 5 25.8	6 10 21.7	+ 3 53.7	+1 4 24.6	+44 56.8	9.492 3315	0.121 2970	0.120 9156

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
May 16	49 57 43.0	6 4 52.8	+ 1 11.5	+0 19 29.5	+44 46.4	9.495 4996	0.121 7121	0.121 5620
17	56 5 25.8	6 10 21.7	3 53.7	1 4 24.6	44 56.8	9.492 3315	0.121 2970	0.120 9156
18	62 18 2.6	6 14 39.2	6 27.0	1 49 9.0	44 24.7	9.489 9726	0.120 4163	0.119 7979
19	68 34 17.7	6 17 37.0	8 43.3	2 32 59.4	43 8.6	9.488 4734	0.119 0596	0.118 2008
20	74 52 47.9	6 19 8.6	10 35.0	3 15 11.9	41 9.2	9.487 8672	0.117 2212	0.116 1209
21	81 12 4.9	6 19 10.2	+11 55.9	+3 55 4.4	+38 29.1	9.488 1679	0.114 9003	0.113 5598
22	87 30 37.9	6 17 40.7	12 41.9	4 31 58.2	35 13.0	9.489 3686	0.112 1005	0.110 5235
23	93 46 56.5	6 14 42.0	12 51.1	5 5 20.5	31 27.3	9.491 4424	0.108 8303	0.107 0225
24	99 59 33.7	6 10 18.9	12 24.0	5 34 45.3	27 19.3	9.494 3442	0.105 1020	0.103 0710
25	106 7 8.8	6 4 39.1	11 23.2	5 59 54.3	22 57.0	9.498 0133	0.100 9319	0.098 6873
26	112 8 29.5	5 57 51.9	+ 9 53.2	+6 20 37.1	+18 28.3	9.502 3766	0.096 3396	0.093 8917
27	118 2 33.8	5 50 8.1	7 59.8	6 36 51.1	14 0.6	9.507 3525	0.091 3466	0.088 7072
28	123 48 30.6	5 41 39.0	5 49.6	6 48 40.5	9 40.0	9.512 8545	0.085 9765	0.083 1575
29	129 25 40.6	5 32 36.4	3 29.2	6 56 15.1	5 31.6	9.518 7947	0.080 2533	0.077 2670
30	134 53 35.9	5 23 11.4	+ 1 5.0	6 59 49.0	+ 1 39.2	9.525 0866	0.074 2017	0.071 0604
31	140 11 59.2	5 13 34.0	− 1 17.3	+6 59 39.7	− 1 54.5	9.531 6476	0.067 8461	0.064 5618
June 1	145 20 42.8	5 3 53.3	3 32.8	6 56 6.6	5 8.2	9.538 4006	0.061 2103	0.057 7945
2	150 19 47.3	4 54 17.0	5 37.7	6 49 30.1	8 1.4	9.545 2752	0.054 3170	0.050 7805
3	155 9 20.3	4 44 51.2	7 29.0	6 40 10.4	10 34.5	9.552 2076	0.047 1875	0.043 5407
4	159 49 34.9	4 35 41.0	9 4.8	6 28 27.6	12 48.0	9.559 1417	0.039 8424	0.036 0951
5	164 20 48.8	4 26 50.3	−10 23.9	+6 14 40.5	−14 43.2	9.566 0286	0.032 3008	0.028 4617
6	168 43 23.0	4 18 21.9	11 25.8	5 59 6.8	16 21.5	9.572 8261	0.024 5799	0.020 6574
7	172 57 40.7	4 10 17.6	12 10.6	5 42 2.6	17 44.4	9.579 4981	0.016 6961	0.012 6980
8	177 4 6.6	4 2 38.5	12 38.9	5 23 42.6	18 53.5	9.586 0147	0.008 6648	0.004 5982
9	181 3 6.3	3 55 25.2	12 51.4	5 4 19.8	19 50.2	9.592 3506	0.000 4997	9.996 3711
10	184 55 5.7	3 48 37.9	−12 49.4	+4 44 5.9	−20 35.9	9.598 4851	9.992 2138	9.988 0294
11	188 40 30.7	3 42 16.2	12 34.0	4 23 11.2	21 12.0	9.604 4013	9.983 8192	9.979 5846
12	192 19 46.6	3 36 19.7	12 6.5	4 1 44.6	21 39.8	9.610 0859	9.975 3271	9.971 0481
13	195 53 18.3	3 30 47.7	11 28.4	3 39 54.0	22 0.3	9.615 5281	9.966 7489	9.962 4308
14	199 21 29.8	3 25 39.3	10 41.0	3 17 46.2	22 14.4	9.620 7197	9.958 0950	9.953 7429
15	202 44 44.3	3 20 53.5	− 9 45.6	+2 55 27.0	−22 23.1	9.625 6544	9.949 3759	9.944 9953
16	206 3 24.0	3 16 29.5	8 43.4	2 33 1.6	22 27.0	9.630 3277	9.940 6023	9.936 1982
17	209 17 50.3	3 12 26.4	7 35.8	2 10 34.4	22 26.8	9.634 7362	9.931 7845	9.927 3626
18	212 28 23.4	3 8 43.1	6 23.8	1 48 9.1	22 23.2	9.638 8778	9.922 9341	9.918 5003
19	215 35 22.8	3 5 18.8	5 8.5	1 25 49.1	22 16.5	9.642 7512	9.914 0629	9.909 6233
20	218 39 7.0	3 2 12.7	− 3 50.9	+1 3 37.1	−22 7.2	9.646 3559	9.905 1833	9.900 7446
21	221 39 53.9	2 59 24.0	2 32.0	0 41 35.5	21 55.6	9.649 6919	9.896 3092	9.891 8788
22	224 38 0.4	2 56 51.8	− 1 12.5	+0 19 46.5	21 42.0	9.652 7594	9.887 4556	9.883 0416
23	227 33 42.7	2 54 35.4	+ 0 6.6	−0 1 48.0	21 26.8	9.655 5591	9.878 6392	9.874 2506
24	230 27 16.4	2 52 34.3	1 24.7	0 23 6.5	21 10.0	9.658 0918	9.869 8783	9.865 5249
25	233 18 56.5	2 50 48.0	+ 2 41.1	−0 44 7.5	−20 51.8	9.660 3585	9.861 1933	9.856 8864
26	236 8 57.4	2 49 16.0	3 55.2	1 4 49.7	20 32.3	9.662 3603	9.852 6072	9.848 3590
27	238 57 33.1	2 47 57.7	5 6.3	1 25 11.8	20 11.7	9.664 0981	9.844 1453	9.839 9697
28	241 44 57.2	2 46 52.7	6 14.0	1 45 12.8	19 50.1	9.665 5728	9.835 8361	9.831 7484
29	244 31 22.9	2 46 0.7	7 17.8	2 4 51.6	19 27.3	9.666 7852	9.827 7109	9.823 7279
30	247 17 3.0	2 45 21.5	+ 8 17.2	−2 24 7.0	−19 3.4	9.667 7362	9.819 8042	9.815 9446
July 1	250 2 10.2	2 44 54.9	+ 9 11.7	−2 42 58.1	−18 38.6	9.668 4265	9.812 1542	9.808 4384

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	250 2 10.2	2 44 54.9	+ 9 11.7	−2 42 58.1	−18 38.6	9.668 4265	9.812 1542	9.808 4384
2	252 46 57.0	2 44 40.7	10 1.0	3 1 23.9	18 12.8	9.668 8564	9.804 8026	9.801 2526
3	255 31 35.7	2 44 38.8	10 44.7	3 19 23.3	17 45.8	9.669 0261	9.797 7944	9.794 4340
4	258 16 18.5	2 44 49.0	11 22.5	3 36 55.1	17 17.6	9.668 9359	9.791 1776	9.788 0317
5	261 1 17.7	2 45 11.4	11 54.1	3 53 58.1	16 48.2	9.668 5857	9.785 0029	9.782 0981
6	263 46 45.3	2 45 46.0	+12 19.1	−4 10 31.0	−16 17.4	9.667 9752	9.779 3241	9.776 6878
7	266 32 53.8	2 46 33.0	12 37.3	4 26 32.4	15 45.2	9.667 1040	9.774 1962	9.771 8563
8	269 19 55.5	2 47 32.5	12 48.4	4 42 0.8	15 11.3	9.665 9715	9.769 6751	9.767 6595
9	272 8 3.0	2 48 44.6	12 52.3	4 56 54.4	14 35.6	9.664 5770	9.765 8164	9.764 1524
10	274 57 29.1	2 50 9.7	12 48.8	5 11 11.4	13 58.1	9.662 9197	9.762 6741	9.761 3878
11	277 48 26.9	2 51 48.0	+12 37.6	−5 24 49.9	−13 18.5	9.660 9988	9.760 2996	9.759 4152
12	280 41 9.7	2 53 39.9	12 18.8	5 37 47.6	12 36.4	9.658 8133	9.758 7399	9.758 2787
13	283 35 51.4	2 55 45.7	11 52.2	5 50 1.8	11 51.7	9.656 3621	9.758 0360	9.758 0158
14	286 32 46.0	2 58 5.9	11 17.8	6 1 30.0	11 4.2	9.653 6441	9.758 2216	9.758 6561
15	289 32 8.2	3 0 41.0	10 35.6	6 12 9.1	10 13.5	9.650 6586	9.759 3217	9.760 2201
16	292 34 13.3	3 3 31.6	+ 9 45.8	−6 21 55.8	− 9 19.3	9.647 4049	9.761 3523	9.762 7187
17	295 39 16.9	3 6 38.2	8 48.5	6 30 46.5	8 21.3	9.643 8827	9.764 3188	9.766 1518
18	298 47 35.3	3 10 1.4	7 43.9	6 38 37.0	7 19.0	9.640 0915	9.768 2159	9.770 5089
19	301 59 25.5	3 13 41.9	6 32.5	6 45 23.0	6 12.1	9.636 0319	9.773 0277	9.775 7688
20	305 15 5.2	3 17 40.5	5 14.7	6 50 59.6	5 0.2	9.631 7049	9.778 7280	9.781 9007
21	308 34 52.7	3 21 57.7	+ 3 51.1	−6 55 21.6	− 3 42.8	9.627 1124	9.785 2816	9.788 8651
22	311 59 7.1	3 26 34.3	2 22.4	6 58 23.3	2 19.4	9.622 2574	9.792 6449	9.796 6145
23	315 28 8.1	3 31 31.1	+ 0 49.6	6 59 58.3	− 0 49.6	9.617 1440	9.800 7669	9.805 0950
24	319 2 16.2	3 36 48.7	− 0 46.1	7 0 0.1	+ 0 47.2	9.611 7779	9.809 5914	9.814 2485
25	322 41 52.6	3 42 27.6	2 23.6	6 58 21.4	2 31.4	9.606 1665	9.819 0584	9.824 0130
26	326 27 18.8	3 48 28.5	− 4 1.3	−6 54 54.6	+ 4 23.5	9.600 3198	9.829 1042	9.834 3239
27	330 18 57.1	3 54 51.8	5 37.3	6 49 31.6	6 23.8	9.594 2506	9.839 6638	9.845 1155
28	334 17 9.8	4 1 37.6	7 9.8	6 42 4.1	8 32.6	9.587 9746	9.850 6710	9.856 3221
29	338 22 19.7	4 8 45.9	8 36.4	6 32 23.5	10 50.1	9.581 5111	9.862 0607	9.867 8787
30	342 34 48.9	4 16 16.2	9 54.7	6 20 21.0	13 16.2	9.574 8837	9.873 7681	9.879 7209
31	346 54 59.2	4 24 7.9	−11 2.1	−6 5 48.2	+15 50.6	9.568 1213	9.885 7293	9.891 7855
Aug. 1	351 23 11.4	4 32 19.8	11 55.8	5 48 37.1	18 32.8	9.561 2578	9.897 8821	9.904 0116
2	355 59 44.9	4 40 49.9	12 33.0	5 28 40.3	21 21.7	9.554 3334	9.910 1666	9.916 3396
3	0 44 56.5	4 49 35.6	12 51.0	5 5 51.9	24 15.7	9.547 3950	9.922 5234	9.928 7110
4	5 39 0.2	4 58 33.5	12 47.4	4 40 7.8	27 12.9	9.540 4965	9.934 8955	9.941 0699
5	10 42 6.2	5 7 39.3	−12 20.3	−4 11 26.1	+30 10.4	9.533 6991	9.947 2274	9.953 3614
6	15 54 19.6	5 16 47.4	11 28.2	3 39 48.2	33 4.6	9.527 0714	9.959 4652	9.965 5322
7	21 15 39.6	5 25 51.2	10 10.9	3 5 19.5	35 51.3	9.520 6885	9.971 5560	9.977 5304
8	26 45 58.1	5 34 43.1	8 29.2	2 28 9.8	38 25.7	9.514 6316	9.983 4491	9.989 3060
9	32 24 59.0	5 43 14.3	6 25.1	1 48 34.1	40 42.3	9.508 9862	9.995 0950	0.000 8103
10	38 12 16.8	5 51 15.2	− 4 2.5	−1 6 53.1	+42 35.2	9.503 8401	0.006 4462	0.011 9972
11	44 7 15.9	5 58 35.3	− 1 26.4	−0 23 33.5	43 58.6	9.499 2803	0.017 4579	0.022 8231
12	50 9 10.3	6 5 4.0	+ 1 16.6	+0 20 52.6	44 47.2	9.495 3903	0.028 0880	0.033 2478
13	56 17 3.3	6 10 30.7	3 58.6	1 5 48.0	44 56.4	9.492 2463	0.038 2979	0.043 2342
14	62 29 48.0	6 14 45.9	6 31.6	1 50 31.4	44 23.0	9.489 9133	0.048 0529	0.052 7504
15	68 46 8.5	6 17 41.1	+ 8 47.2	+2 34 19.4	+43 5.6	9.488 4416	0.057 3237	0.061 7698
16	75 4 41.4	6 19 9.9	+10 38.0	+3 16 28.2	+41 4.9	9.487 8636	0.066 0862	0.070 2709

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Aug. 16	75 4 41.4	6 19 9.9	+10 38.0	+3 16 28.2	+41 4.9	9.487 8636	0.066 0862	0.070 2709
17	81 23 58.4	6 19 8.7	11 57.9	3 56 15.7	38 23.5	9.488 1923	0.074 3220	0.078 2381
18	87 42 28.5	6 17 36.4	12 42.8	4 33 3.5	35 6.3	9.489 4204	0.082 0186	0.085 6629
19	93 58 41.5	6 14 35.0	12 50.8	5 6 18.8	31 19.8	9.491 5206	0.089 1707	0.092 5423
20	100 11 10.5	6 10 9.5	12 22.6	5 35 35.9	27 11.3	9.494 4472	0.095 7782	0.098 8791
21	106 18 35.0	6 4 27.4	+11 20.8	+6 0 36.7	+22 48.7	9.498 1390	0.101 8463	0.104 6812
22	112 19 43.0	5 57 38.2	9 50.0	6 21 11.2	18 19.9	9.502 5225	0.107 3856	0.109 9616
23	118 13 32.7	5 49 52.8	7 56.0	6 37 17.0	13 52.3	9.507 5159	0.112 4112	0.114 7368
24	123 59 13.7	5 41 22.6	5 45.4	6 48 58.3	9 32.1	9.513 0327	0.116 9411	0.119 0266
25	129 36 6.8	5 32 19.2	3 24.8	6 56 25.2	5 24.2	9.518 9851	0.120 9961	0.122 8524
26	135 3 44.6	5 22 53.6	+ 1 0.6	+6 59 52.0	+ 1 32.3	9.525 2865	0.124 5983	0.126 2369
27	140 21 50.0	5 13 16.0	− 1 21.6	6 59 36.2	− 2 0.8	9.531 8546	0.127 7711	0.129 2039
28	145 30 15.6	5 3 35.3	3 36.9	6 55 57.1	5 13.9	9.538 6124	0.130 5382	0.131 7770
29	150 29 2.2	4 53 59.2	5 41.4	6 49 15.1	8 6.5	9.545 4895	0.132 9233	0.133 9798
30	155 18 17.7	4 44 34.0	7 32.2	6 39 50.8	10 38.8	9.552 4225	0.134 9493	0.135 8346
31	159 58 15.4	4 35 24.4	− 9 7.5	+6 28 3.9	−12 51.8	9.559 3557	0.136 6382	0.137 3627
Sept. 1	164 29 12.9	4 26 34.2	10 26.1	6 14 13.2	14 46.5	9.566 2404	0.138 0107	0.138 5845
2	168 51 31.3	4 18 6.5	11 27.4	5 58 36.5	16 24.3	9.573 0345	0.139 0864	0.139 5187
3	173 5 34.0	4 10 3.0	12 11.7	5 41 29.8	17 46.8	9.579 7022	0.139 8836	0.140 1831
4	177 11 45.7	4 2 24.7	12 39.5	5 23 7.6	18 55.4	9.586 2134	0.140 4190	0.140 5934
5	181 10 32.1	3 55 12.3	−12 51.6	+5 3 43.1	−19 51.7	9.592 5432	0.140 7079	0.140 7642
6	185 2 19.0	3 48 25.7	12 49.1	4 43 27.8	20 37.2	9.598 6711	0.140 7639	0.140 7086
7	188 47 32.2	3 42 4.9	12 33.3	4 22 31.9	21 13.1	9.604 5803	0.140 5998	0.140 4387
8	192 26 37.2	3 36 9.2	12 5.5	4 1 4.5	21 40.6	9.610 2575	0.140 2266	0.139 9648
9	195 59 58.7	3 30 37.8	11 27.1	3 39 13.2	22 0.8	9.615 6920	0.139 6544	0.139 2964
10	199 28 0.7	3 25 30.0	−10 39.4	+3 17 5.0	−22 14.7	9.620 8756	0.138 8918	0.138 4416
11	202 51 6.4	3 20 45.0	9 43.7	2 54 45.6	22 23.3	9.625 8022	0.137 9466	0.137 4077
12	206 9 38.0	3 16 21.7	8 41.4	2 32 20.0	22 27.1	9.630 4673	0.136 8257	0.136 2012
13	209 23 56.8	3 12 19.2	7 33.6	2 9 52.8	22 26.8	9.634 8675	0.135 5348	0.134 8271
14	212 34 23.0	3 8 36.5	6 21.5	1 47 27.7	22 23.0	9.639 0008	0.134 0785	0.133 2896
15	215 41 16.1	3 5 12.8	− 5 6.1	+1 25 7.8	−22 16.2	9.642 8659	0.132 4607	0.131 5923
16	218 44 54.7	3 2 7.2	3 48.5	1 2 56.1	22 6.8	9.646 4623	0.130 6848	0.129 7383
17	221 45 36.4	2 59 19.0	2 29.5	0 40 54.9	21 55.2	9.649 7899	0.128 7532	0.127 7296
18	224 43 38.2	2 56 47.3	− 1 10.1	+0 19 6.3	21 41.7	9.652 8491	0.126 6677	0.125 5676
19	227 39 16.3	2 54 31.5	+ 0 9.0	−0 2 27.8	21 26.3	9.655 6405	0.124 4293	0.123 2529
20	230 32 46.3	2 52 31.0	+ 1 27.1	−0 23 45.8	−21 9.4	9.658 1650	0.122 0385	0.120 7861
21	233 24 23.2	2 50 45.1	2 43.4	0 44 46.2	20 51.2	9.660 4235	0.119 4955	0.118 1666
22	236 14 21.3	2 49 13.4	3 57.4	1 5 27.7	20 31.7	9.662 4171	0.116 7994	0.115 3936
23	239 2 54.7	2 47 55.6	5 8.5	1 25 49.2	20 11.1	9.664 1467	0.113 9492	0.112 4659
24	241 50 16.9	2 46 51.0	6 16.1	1 45 49.5	19 49.4	9.665 6133	0.110 9435	0.109 3817
25	244 36 41.0	2 45 59.4	+ 7 19.7	−2 5 27.6	−19 26.6	9.666 8177	0.107 7802	0.106 1386
26	247 22 19.9	2 45 20.6	8 18.9	2 24 42.3	19 2.7	9.667 7606	0.104 4567	0.102 7340
27	250 7 26.4	2 44 54.4	9 13.3	2 43 32.7	18 37.9	9.668 4427	0.100 9701	0.099 1646
28	252 52 12.8	2 44 40.5	10 2.4	3 1 57.7	18 12.0	9.668 8645	0.097 3169	0.095 4266
29	255 36 51.5	2 44 38.9	10 46.0	3 19 56.3	17 45.0	9.669 0262	0.093 4932	0.091 5160
30	258 21 34.7	2 44 49.5	+11 23.6	−3 37 27.2	−17 16.7	9.668 9279	0.089 4945	0.087 4282
Oct. 1	261 6 34.5	2 45 12.2	+11 54.9	−3 54 29.3	−16 47.2	9.668 5695	0.085 3163	0.083 1582

MERCURY.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance Earth—	
								At Date.	At Inte diate D
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct.	1	261 6 34.5	2 45 12.2	+11 54.9	−3 54 29.3	−16 47.2	9.668 5695	0.085 3163	0.083
	2	263 52 3.2	2 45 47.2	12 19.7	4 11 1.2	16 16.4	9.667 9510	0.080 9532	0.078 7
	3	266 38 13.1	2 46 34.6	12 37.7	4 27 1.6	15 44.1	9.667 0718	0.076 3996	0.074
	4	269 25 16.7	2 47 34.5	12 48.6	4 42 28.9	15 10.2	9.665 9313	0.071 6492	0.069 1
	5	272 13 26.5	2 48 47.1	12 52.3	4 57 21.5	14 34.6	9.664 5287	0.066 6958	0.064 1
	6	275 2 55.3	2 50 12.6	+12 48.6	−5 11 37.4	−13 57.0	9.662 8632	0.061 5326	0.058 8
	7	277 53 56.2	2 51 51.3	12 37.2	5 25 14.6	13 17.2	9.660 9340	0.056 1524	0.053 3
	8	280 46 42.5	2 53 43.6	12 18.1	5 38 11.0	12 35.1	9.658 7402	0.050 5474	0.047 6
	9	283 41 28.1	2 55 49.9	11 51.2	5 50 23.9	11 50.3	9.656 2807	0.044 7101	0.041 7
	10	286 38 27.1	2 58 10.5	11 16.6	6 1 50.6	11 2.7	9.653 5546	0.038 6327	0.035 5
	11	289 37 54.2	3 0 46.1	+10 34.2	−6 12 28.1	−10 11.9	9.650 5608	0.032 3073	0.029 0
	12	292 40 4.6	3 3 37.2	9 44.1	6 22 13.2	9 17.6	9.647 2987	0.025 7258	0.022 33
	13	295 45 14.0	3 6 44.3	8 46.6	6 31 2.0	8 19.4	9.643 7680	0.018 8809	0.015 35
	14	298 53 38.8	3 10 8.0	7 41.8	6 38 50.6	7 17.0	9.639 9684	0.011 7653	0.008 10
	15	302 5 35.9	3 13 49.1	6 30.2	6 45 34.5	6 10.0	9.635 9004	0.004 3725	0.000 57
	16	305 21 23.0	3 17 48.3	+ 5 12.2	−6 51 8.9	− 4 57.9	9.631 5652	9.996 6975	9.992 75
	17	308 41 18.6	3 22 6.1	3 48.4	6 55 28.5	3 40.3	9.626 9645	9.988 7367	9.984 64
	18	312 5 41.7	3 26 43.3	2 19.6	6 58 27.6	2 16.7	9.622 1012	9.980 4882	9.976 25
	19	315 34 52.0	3 31 40.7	+ 0 46.7	6 59 59.8	− 0 46.6	9.616 9797	9.971 9538	9.967 58
	20	319 9 10.0	3 36 58.9	− 0 49.2	6 59 58.6	+ 0 50.4	9.611 6059	9.963 1387	9.958 62
	21	322 48 57.0	3 42 38.5	− 2 26.7	−6 58 16.7	+ 2 34.8	9.605 9873	9.954 0534	9.949 41
	22	326 34 34.5	3 48 40.1	4 4.3	6 54 46.4	4 27.1	9.600 1336	9.944 7149	9.939 95
	23	330 26 24.7	3 55 4.1	5 40.3	6 49 19.7	6 27.7	9.594 0577	9.935 1477	9.930 28
	24	334 24 50.2	4 1 50.6	7 12.6	6 41 48.2	8 36.8	9.587 7754	9.925 3869	9.920 44
	25	338 30 13.4	4 8 59.5	8 39.0	6 32 3.2	10 54.5	9.581 3063	9.915 4801	9.910 49
	26	342 42 56.6	4 16 30.6	− 9 57.0	−6 19 56.2	+13 20.8	9.574 6743	9.905 4896	9.900 487
	27	347 3 21.7	4 24 23.0	11 4.0	6 5 18.7	15 55.5	9.567 9082	9.895 4958	9.890 528
	28	351 31 49.3	4 32 35.5	11 57.2	5 48 2.5	18 38.0	9.561 0421	9.885 5988	9.880 724
	29	356 8 38.7	4 41 6.2	12 33.8	5 28 0.4	21 27.1	9.554 1165	9.875 9232	9.871 213
	30	0 54 6.8	4 49 52.4	12 51.2	5 5 6.6	24 21.3	9.547 1786	9.866 6177	9.862 157
	31	5 48 27.4	4 58 50.6	−12 46.9	−4 39 16.9	+27 18.5	9.540 2824	9.857 8564	9.853 741
Nov.	1	10 51 50.4	5 7 56.4	12 19.0	4 10 29.7	30 15.8	9.533 4894	9.849 8376	9.846 173
	2	16 4 20.9	5 17 4.4	11 26.2	3 38 46.5	33 9.9	9.526 8683	9.842 7778	9.839 678
	3	21 25 57.8	5 26 8.0	10 8.1	3 4 12.6	35 56.3	9.520 4944	9.836 9049	9.834 484
	4	26 56 32.9	5 34 59.5	8 25.6	2 26 58.1	38 30.2	9.514 4490	9.832 4440	9.830 808
	5	32 35 49.8	5 43 29.9	− 6 20.9	−1 47 18.1	+40 46.2	9.508 8180	9.829 6018	9.828 842
	6	38 23 22.5	5 51 29.5	3 57.8	1 5 33.6	42 38.3	9.503 6890	9.828 5482	9.828 730
	7	44 18 35.3	5 58 48.2	− 1 21.4	−0 22 11.4	44 0.7	9.499 1490	9.829 3985	9.830 555
	8	50 20 41.8	6 5 15.2	+ 1 21.6	+0 22 16.2	44 48.1	9.495 2813	9.832 1995	9.834 325
	9	56 28 44.9	6 10 39.8	4 3.5	1 7 11.8	44 56.0	9.492 1620	9.836 9209	9.839 971
	10	62 41 37.4	6 14 52.5	+ 6 36.1	+1 51 54.1	+44 21.2	9.489 8554	9.843 4567	9.847 353
	11	68 58 3.2	6 17 45.0	8 51.0	2 35 39.7	43 2.5	9.488 4112	9.851 6340	9.856 270
	12	75 16 38.7	6 19 11.1	10 40.9	3 17 44.8	41 0.4	9.487 8615	9.861 2304	9.866 482
	13	81 35 55.4	6 19 7.1	11 59.8	3 57 27.2	38 17.9	9.488 2186	9.871 9918	9.877 726
	14	87 54 22.5	6 17 31.9	12 43.6	4 34 8.8	34 59.7	9.489 4745	9.883 6531	9.889 739
	15	94 10 29.6	6 14 27.8	+12 50.5	+5 7 17.0	+31 12.3	9.491 6012	9.895 9546	9.902 269
	16	100 22 50.1	6 9 59.8	+12 21.2	+5 36 26.3	+27 3.3	9.494 5527	9.908 6562	9.915 089

[Eph 14]

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Nov. 16	100 22 50.1	6 9 59.8	+12 21.2	+5 36 26.3	+27 3.3	9.494 5527	9.908 6562	9.915 0893
17	106 30 3.7	6 4 15.5	11 18.4	6 1 19.0	22 40.5	9.498 2672	9.921 5451	9.928 0020
18	112 30 58.8	5 57 24.4	9 46.8	6 21 45.2	18 11.6	9.502 6709	9.934 4406	9.940 8433
19	118 24 33.8	5 49 37.4	7 52.2	6 37 42.7	13 44.1	9.507 6819	9.947 1948	9.953 4814
20	124 9 58.7	5 41 6.0	5 41.2	6 49 16.0	9 24.2	9.513 2136	9.959 6911	9.965 8138
21	129 46 34.8	5 32 1.7	+ 3 20.4	+6 56 35.2	+ 5 16.7	9.519 1781	9.971 8409	9.977 7650
22	135 13 54.8	5 22 35.6	+ 0 56.1	6 59 54.8	+ 1 25.4	9.525 4890	9.983 5801	9.989 2815
23	140 31 42.1	5 12 57.8	− 1 25.9	6 59 32.3	− 2 7.1	9.532 0640	9.994 8654	0.000 3289
24	145 39 49.5	5 3 17.2	3 40.9	6 55 47.3	5 19.6	9.538 8265	0.005 6698	0.010 8867
25	150 38 18.1	4 53 41.4	5 45.0	6 49 0.0	8 11.5	9.545 7061	0.015 9790	0.020 9466
26	155 27 15.9	4 44 16.5	− 7 35.5	+6 39 31.0	−10 43.2	9.552 6398	0.025 7896	0.030 5089
27	160 6 56.3	4 35 7.4	9 10.2	6 27 40.0	12 55.6	9.559 5722	0.035 1056	0.039 5809
28	164 37 37.3	4 26 18.1	10 28.2	6 13 45.8	14 49.7	9.566 4545	0.043 9365	0.048 1741
29	168 59 39.9	4 17 51.1	11 29.0	5 58 6.1	16 27.0	9.573 2449	0.052 2956	0.056 3031
30	173 13 27.5	4 9 48.3	12 12.8	5 40 56.8	17 49.1	9.579 9080	0.060 1988	0.063 9849
Dec. 1	177 19 24.9	4 2 10.8	−12 40.1	+5 22 32.5	−18 57.3	9.586 4139	0.067 6639	0.071 2381
2	181 17 57.8	3 54 59.2	12 51.7	5 3 6.3	19 53.2	9.592 7376	0.074 7098	0.078 0812
3	185 9 32.0	3 48 13.5	12 48.8	4 42 49.6	20 38.4	9.598 8587	0.081 3547	0.084 5325
4	188 54 33.4	3 41 53.4	12 32.6	4 21 52.7	21 14.0	9.604 7608	0.087 6171	0.090 6108
5	192 33 27.3	3 35 58.5	12 4.5	4 0 24.4	21 41.3	9.610 4304	0.093 5156	0.096 3338
6	196 6 38.5	3 30 28.0	−11 25.8	+3 38 32.5	−22 1.4	9.615 8572	0.099 0674	0.101 7185
7	199 34 31.0	3 25 21.0	10 37.8	3 16 23.8	22 15.2	9.621 0329	0.104 2891	0.106 7812
8	202 57 27.9	3 20 36.5	9 41.9	2 54 4.1	22 23.5	9.625 9513	0.109 1965	0.111 5369
9	206 15 51.3	3 16 13.8	8 39.4	2 31 38.5	22 27.1	9.630 6080	0.113 8043	0.116 0004
10	209 30 2.5	3 12 11.9	7 31.4	2 9 11.4	22 26.7	9.634 9999	0.118 1267	0.120 1849
11	212 40 21.8	3 8 29.9	− 6 19.2	+1 46 46.4	−22 22.8	9.639 1249	0.122 1764	0.124 1028
12	215 47 8.7	3 5 6.8	5 3.7	1 24 26.7	22 16.0	9.642 9816	0.125 9655	0.127 7658
13	218 50 41.6	3 2 1.8	3 46.0	1 2 15.2	22 6.5	9.646 5696	0.129 5049	0.131 1842
14	221 51 18.1	2 59 14.1	2 27.1	0 40 14.4	21 54.8	9.649 8888	0.132 8048	0.134 3680
15	224 49 15.2	2 56 42.9	− 1 7.6	+0 18 26.2	21 41.2	9.652 9396	0.135 8749	0.137 3265
16	227 44 49.2	2 54 27.6	+ 0 11.5	−0 3 7.4	−21 25.8	9.655 7226	0.138 7237	0.140 0675
17	230 38 15.5	2 52 27.5	1 29.5	0 24 24.9	21 8.9	9.658 2387	0.141 3588	0.142 5986
18	233 29 49.1	2 50 42.1	2 45.7	0 45 24.8	20 50.6	9.660 4889	0.143 7877	0.144 9269
19	236 19 44.4	2 49 10.8	3 59.6	1 6 5.7	20 31.0	9.662 4742	0.146 0170	0.147 0586
20	239 8 15.4	2 47 53.4	5 10.6	1 26 26.5	20 10.4	9.664 1957	0.148 0524	0.148 9990
21	241 55 35.6	2 46 49.2	+ 6 18.1	−1 46 26.2	−19 48.7	9.665 6542	0.149 8990	0.150 7530
22	244 41 58.2	2 45 58.1	7 21.6	2 6 3.5	19 25.9	9.666 8505	0.151 5616	0.152 3252
23	247 27 36.0	2 45 19.7	8 20.7	2 25 17.5	19 2.0	9.667 7852	0.153 0443	0.153 7193
24	250 12 41.7	2 44 53.8	9 14.9	2 44 7.2	18 37.1	9.668 4592	0.154 3506	0.154 9384
25	252 57 27.7	2 44 40.3	10 3.9	3 2 31.4	18 11.1	9.668 8729	0.155 4832	0.155 9852
26	255 42 6.4	2 44 39.1	+10 47.2	−3 20 29.1	−17 44.0	9.669 0266	0.156 4447	0.156 8617
27	258 26 49.9	2 44 50.0	11 24.7	3 37 59.1	17 15.8	9.668 9203	0.157 2366	0.157 5695
28	261 11 50.5	2 45 13.2	11 55.8	3 55 0.3	16 46.3	9.668 5539	0.157 8604	0.158 1095
29	263 57 20.4	2 45 48.6	12 20.4	4 11 31.3	16 15.5	9.667 9272	0.158 3168	0.158 4823
30	266 43 31.9	2 46 36.4	12 38.2	4 27 30.8	15 43.2	9.667 0399	0.158 6060	0.158 6879
31	269 30 37.4	2 47 36.7	+12 48.9	−4 42 57.1	−15 9.1	9.665 8913	0.158 7278	0.158 7255
32	272 18 49.5	2 48 49.6	+12 52.3	−4 57 48.5	−14 33.3	9.664 4806	0.158 6808	0.158 5938

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fro Earth—	
							At Date.	At Interm diate Dat
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	256 53 22.7	1 35 11.2	+0 6.2	−0 3 30.1	−5 38.7	9.861 0920	0.223 9915	0.224 44
3	260 3 41.8	1 35 7.9	0 26.2	0 14 46.5	5 37.6	9.861 2224	0.224 8880	0.225 32
5	263 13 54.6	1 35 4.9	0 45.8	0 25 59.7	5 35.6	9.861 3468	0.225 7420	0.226 15
7	266 24 1.5	1 35 2.1	1 4.9	0 37 7.9	5 32.5	9.861 4650	0.226 5540	0.226 94
9	269 34 3.2	1 34 59.6	1 23.2	0 48 8.9	5 28.4	9.861 5766	0.227 3250	0.227 69
11	272 44 0.2	1 34 57.4	+1 40.4	−0 59 0.7	−5 23.3	9.861 6812	0.228 0558	0.228 40
13	275 53 53.1	1 34 55.6	1 56.4	1 9 41.4	5 17.3	9.861 7785	0.228 7468	0.229 07
15	279 3 42.6	1 34 54.0	2 11.0	1 20 9.1	5 10.3	9.861 8683	0.229 3980	0.229 70
17	282 13 29.2	1 34 52.7	2 24.0	1 30 22.0	5 2.4	9.861 9502	0.230 0090	0.230 29
19	285 23 13.4	1 34 51.7	2 35.2	1 40 18.1	4 53.6	9.862 0241	0.230 5798	0.230 85
21	288 32 55.8	1 34 50.9	+2 44.5	−1 49 55.7	−4 43.9	9.862 0897	0.231 1098	0.231 359
23	291 42 37.0	1 34 50.4	2 51.8	1 59 13.0	4 33.4	9.862 1469	0.231 5984	0.231 827
25	294 52 17.6	1 34 50.2	2 57.0	2 8 8.5	4 22.0	9.862 1954	0.232 0454	0.232 253
27	298 1 58.0	1 34 50.3	3 0.1	2 16 40.5	4 9.9	9.862 2351	0.232 4507	0.232 637
29	301 11 38.8	1 34 50.6	3 1.0	2 24 47.5	3 57.0	9.862 2659	0.232 8145	0.232 980
31	304 21 20.4	1 34 51.1	+2 59.7	−2 32 28.0	−3 43.4	9.862 2877	0.233 1369	0.233 282
Feb. 2	307 31 3.2	1 34 51.8	2 56.2	2 39 40.7	3 29.2	9.862 3005	0.233 4184	0.233 543
4	310 40 47.8	1 34 52.7	2 50.5	2 46 24.2	3 14.3	9.862 3042	0.233 6593	0.233 764
6	313 50 34.5	1 34 53.9	2 42.8	2 52 37.4	2 58.8	9.862 2987	0.233 8597	0.233 945
8	317 0 23.7	1 34 55.3	2 33.1	2 58 19.1	2 42.8	9.862 2842	0.234 0202	0.234 085
10	320 10 15.7	1 34 56.8	+2 21.5	−3 3 28.2	−2 26.3	9.862 2606	0.234 1410	0.234 186
12	323 20 11.0	1 34 58.5	2 8.2	3 8 3.9	2 9.3	9.862 2281	0.234 2221	0.234 2476
14	326 30 9.7	1 35 0.3	1 53.3	3 12 5.2	1 51.9	9.862 1867	0.234 2630	0.234 268
16	329 40 12.2	1 35 2.3	1 37.1	3 15 31.5	1 34.2	9.862 1365	0.234 2633	0.234 2478
18	332 50 18.8	1 35 4.4	1 19.7	3 18 22.0	1 16.2	9.862 0777	0.234 2218	0.234 1851
20	336 0 29.7	1 35 6.5	+1 1.3	−3 20 36.2	−0 57.9	9.862 0104	0.234 1377	0.234 0795
22	339 10 45.0	1 35 8.8	0 42.1	3 22 13.7	0 39.5	9.861 9349	0.234 0103	0.233 9300
24	342 21 5.1	1 35 11.2	0 22.4	3 23 14.2	0 20.9	9.861 8514	0.233 8385	0.233 7358
26	345 31 30.0	1 35 13.7	+0 2.4	3 23 37.4	−0 2.2	9.861 7600	0.233 6219	0.233 4968
28	348 42 0.0	1 35 16.3	−0 17.6	3 23 23.2	+0 16.5	9.861 6612	0.233 3604	0.233 2126
Mar. 2	351 52 35.1	1 35 18.9	−0 37.4	−3 22 31.6	+0 35.1	9.861 5552	0.233 0534	0.232 8827
4	355 3 15.5	1 35 21.6	0 56.8	3 21 2.7	0 53.7	9.861 4423	0.232 7005	0.232 5068
6	358 14 1.4	1 35 24.3	1 15.5	3 18 56.7	1 12.2	9.861 3228	0.232 3017	0.232 0851
8	1 24 52.8	1 35 27.1	1 33.2	3 16 13.9	1 30.5	9.861 1971	0.231 8571	0.231 6176
10	4 35 49.8	1 35 29.9	1 49.8	3 12 54.8	1 48.5	9.861 0655	0.231 3666	0.231 1041
12	7 46 52.5	1 35 32.8	−2 5.1	−3 8 59.9	+2 6.2	9.860 9285	0.230 8300	0.230 5443
14	10 58 1.1	1 35 35.7	2 18.8	3 4 29.8	2 23.6	9.860 7865	0.230 2469	0.229 9377
16	14 9 15.6	1 35 38.7	2 30.8	2 59 25.5	2 40.6	9.860 6399	0.229 6166	0.229 2833
18	17 20 36.1	1 35 41.7	2 41.0	2 53 47.7	2 57.1	9.860 4892	0.228 9377	0.228 5797
20	20 32 2.7	1 35 44.8	2 49.2	2 47 37.4	3 13.1	9.860 3347	0.228 2091	0.227 8257
22	23 43 35.4	1 35 47.9	−2 55.3	−2 40 55.6	+3 28.6	9.860 1770	0.227 4294	0.227 0201
24	26 55 14.3	1 35 51.0	2 59.2	2 33 43.6	3 43.4	9.860 0166	0.226 5975	0.226 1615
26	30 6 59.6	1 35 54.2	3 0.9	2 26 2.7	3 57.5	9.859 8539	0.225 7121	0.225 2492
28	33 18 51.3	1 35 57.5	3 0.4	2 17 54.1	4 10.9	9.859 6895	0.224 7726	0.224 2822
30	36 30 49.6	1 36 0.8	2 57.6	2 9 19.4	4 23.6	9.859 5239	0.223 7779	0.223 2596
Apr. 1	39 42 54.4	1 36 4.1	−2 52.6	−2 0 20.1	+4 35.5	9.859 3575	0.222 7272	0.222 1807
3	42 55 5.9	1 36 7.4	−2 45.4	−1 50 57.9	+4 46.5	9.859 1910	0.221 6200	0.221 0450

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 1	39 42 54.4	1 36 4.1	−2 52.6	−2 0 20.1	+4 35.5	9.859 3575	0.222 7272	0.222 1807
3	42 55 5.9	1 36 7.4	2 45.4	1 50 57.9	4 46.5	9.859 1910	0.221 6200	0.221 0450
5	46 7 24.2	1 36 10.8	2 36.2	1 41 14.4	4 56.7	9.859 0247	0.220 4559	0.219 8525
7	49 19 49.3	1 36 14.3	2 25.0	1 31 11.5	5 6.0	9.858 8593	0.219 2347	0.218 6025
9	52 32 21.4	1 36 17.8	2 11.9	1 20 50.9	5 14.4	9.858 6953	0.217 9560	0.217 2950
11	55 45 0.5	1 36 21.3	−1 57.2	−1 10 14.7	+5 21.7	9.858 5331	0.216 6196	0.215 9296
13	58 57 46.7	1 36 24.9	1 41.0	0 59 24.8	5 28.0	9.858 3734	0.215 2248	0.214 5051
15	62 10 40.1	1 36 28.5	1 23.5	0 48 23.2	5 33.4	9.858 2166	0.213 7704	0.213 0204
17	65 23 40.7	1 36 32.1	1 5.0	0 37 11.9	5 37.7	9.858 0631	0.212 2551	0.211 4742
19	68 36 48.6	1 36 35.8	0 45.6	0 25 53.2	5 40.9	9.857 9136	0.210 6776	0.209 8650
21	71 50 3.8	1 36 39.4	−0 25.7	−0 14 29.1	+5 43.0	9.857 7685	0.209 0363	0.208 1913
23	75 3 26.3	1 36 43.0	−0 5.4	−0 3 1.8	5 44.1	9.857 6282	0.207 3298	0.206 4517
25	78 16 56.0	1 36 46.7	+0 15.0	+0 8 26.6	5 44.0	9.857 4932	0.205 5568	0.204 6450
27	81 30 33.0	1 36 50.3	0 35.2	0 19 53.7	5 42.9	9.857 3640	0.203 7163	0.202 7704
29	84 44 17.2	1 36 53.9	0 55.0	0 31 17.4	5 40.6	9.857 2409	0.201 8072	0.200 8266
May 1	87 58 8.5	1 36 57.4	+1 14.1	+0 42 35.6	+5 37.3	9.857 1244	0.199 8285	0.198 8129
3	91 12 6.9	1 37 0.9	1 32.2	0 53 46.0	5 32.9	9.857 0148	0.197 7797	0.196 7288
5	94 26 12.1	1 37 4.3	1 49.2	1 4 46.4	5 27.3	9.856 9126	0.195 6603	0.194 5741
7	97 40 24.0	1 37 7.5	2 4.8	1 15 34.7	5 20.8	9.856 8180	0.193 4701	0.192 3484
9	100 54 42.3	1 37 10.7	2 18.8	1 26 8.9	5 13.2	9.856 7313	0.191 2090	0.190 0518
11	104 9 6.8	1 37 13.7	+2 31.0	+1 36 26.7	+5 4.5	9.856 6529	0.188 8767	0.187 6836
13	107 23 37.3	1 37 16.6	2 41.3	1 46 26.3	4 54.9	9.856 5830	0.186 4724	0.185 2428
15	110 38 13.3	1 37 19.3	2 49.5	1 56 5.6	4 44.3	9.856 5219	0.183 9947	0.182 7280
17	113 52 54.6	1 37 21.8	2 55.6	2 5 22.8	4 32.7	9.856 4696	0.181 4425	0.180 1380
19	117 7 40.7	1 37 24.1	2 59.5	2 14 15.9	4 20.3	9.856 4265	0.178 8144	0.177 4716
21	120 22 31.1	1 37 26.2	+3 1.0	+2 22 43.4	+4 7.0	9.856 3927	0.176 1093	0.174 7272
23	123 37 25.5	1 37 28.0	3 0.2	2 30 43.4	3 52.9	9.856 3682	0.173 3253	0.171 9034
25	126 52 23.2	1 37 29.6	2 57.1	2 38 14.4	3 38.0	9.856 3531	0.170 4613	0.168 9988
27	130 7 23.8	1 37 30.9	2 51.7	2 45 14.9	3 22.4	9.856 3476	0.167 5159	0.166 0125
29	133 22 26.6	1 37 31.9	2 44.1	2 51 43.6	3 6.1	9.856 3516	0.164 4884	0.162 9435
31	136 37 31.0	1 37 32.5	+2 34.4	+2 57 39.2	+2 49.3	9.856 3651	0.161 3777	0.159 7911
June 2	139 52 36.5	1 37 32.8	2 22.7	3 3 0.5	2 31.9	9.856 3880	0.158 1836	0.156 5550
4	143 7 42.3	1 37 32.8	2 9.2	3 7 46.5	2 14.0	9.856 4203	0.154 9054	0.153 2347
6	146 22 47.7	1 37 32.5	1 54.0	3 11 56.2	1 55.6	9.856 4619	0.151 5430	0.149 8303
8	149 37 52.2	1 37 31.8	1 37.3	3 15 28.9	1 36.9	9.856 5126	0.148 0966	0.146 3418
10	152 52 54.9	1 37 30.8	+1 19.4	+3 18 23.8	+1 17.9	9.856 5723	0.144 5658	0.142 7685
12	156 7 55.2	1 37 29.4	1 0.5	3 20 40.5	0 58.7	9.856 6407	0.140 9498	0.139 1095
14	159 22 52.3	1 37 27.6	0 40.8	3 22 18.6	0 39.3	9.856 7177	0.137 2474	0.135 3634
16	162 37 45.6	1 37 25.5	0 20.7	3 23 17.6	0 19.8	9.856 8030	0.133 4574	0.131 5290
18	165 52 34.3	1 37 23.1	+0 0.3	3 23 37.6	+0 0.3	9.856 8963	0.129 5782	0.127 6048
20	169 7 17.8	1 37 20.3	−0 20.2	+3 23 18.5	−0 19.3	9.856 9973	0.125 6085	0.123 5892
22	172 21 55.5	1 37 17.2	0 40.4	3 22 20.4	0 38.8	9.857 1056	0.121 5467	0.119 4808
24	175 36 26.6	1 37 13.8	1 0.1	3 20 43.5	0 58.1	9.857 2209	0.117 3913	0.115 2780
26	178 50 50.5	1 37 10.0	1 19.0	3 18 28.2	1 17.1	9.857 3429	0.113 1407	0.110 9793
28	182 5 6.7	1 37 6.0	1 36.8	3 15 35.1	1 35.9	9.857 4711	0.108 7937	0.106 5837
30	185 19 14.6	1 37 1.8	−1 53.4	+3 12 4.8	−1 54.4	9.857 6051	0.104 3493	0.102 0904
July 2	188 33 13.8	1 36 57.3	−2 8.6	+3 7 57.9	−2 12.4	9.857 7445	0.099 8069	0.097 4988

VENUS.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fro Earth—	
								At Date.	At Interm diate Dat
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July	2	188 33 13.8	1 36 57.3	−2 8.6	+3 7 57.9	−2 12.4	9.857 7445	0.099 8069	0.097 49
	4	191 47 3.7	1 36 52.6	2 22.1	3 3 15.4	2 30.0	9.857 8888	0.095 1661	0.092 80
	6	195 0 44.0	1 36 47.6	2 33.8	2 57 58.2	2 47.0	9.858 0376	0.090 4264	0.088 01
	8	198 14 14.2	1 36 42.5	2 43.5	2 52 7.5	3 3.5	9.858 1903	0.085 5878	0.083 13
	10	201 27 34.1	1 36 37.3	2 51.2	2 45 44.5	3 19.4	9.858 3466	0.080 6495	0.078 14
	12	204 40 43.5	1 36 32.0	−2 56.7	+2 38 50.4	−3 34.6	9.858 5058	0.075 6101	0.073 05
	14	207 53 42.0	1 36 26.5	3 0.0	2 31 26.5	3 49.1	9.858 6675	0.070 4685	0.067 85
	16	211 6 29.6	1 36 21.0	3 1.0	2 23 34.4	4 2.8	9.858 8312	0.065 2224	0.062 55
	18	214 19 6.2	1 36 15.5	2 59.8	2 15 15.7	4 15.7	9.858 9963	0.059 8702	0.057 15
	20	217 31 31.7	1 36 10.0	2 56.3	2 6 32.0	4 27.8	9.859 1623	0.054 4099	0.051 63
	22	220 43 46.2	1 36 4.5	−2 50.6	+1 57 25.0	−4 39.1	9.859 3288	0.048 8387	0.046 01
	24	223 55 49.7	1 35 59.0	2 42.7	1 47 56.3	4 49.4	9.859 4951	0.043 1541	0.040 26
	26	227 7 42.3	1 35 53.6	2 32.8	1 38 8.0	4 58.8	9.859 6608	0.037 3539	0.034 40
	28	230 19 24.3	1 35 48.4	2 21.1	1 28 1.8	5 7.2	9.859 8253	0.031 4360	0.028 43
	30	233 30 55.9	1 35 43.3	2 7.6	1 17 39.6	5 14.7	9.859 9882	0.025 3985	0.022 334
Aug.	1	236 42 17.4	1 35 38.3	−1 52.5	+1 7 3.5	−5 21.2	9.860 1489	0.019 2399	0.016 114
	3	239 53 29.0	1 35 33.4	1 36.1	0 56 15.4	5 26.7	9.860 3069	0.012 9590	0.009 772
	5	243 4 31.2	1 35 28.8	1 18.5	0 45 17.4	5 31.2	9.860 4618	0.006 5546	0.003 305
	7	246 15 24.3	1 35 24.4	0 59.9	0 34 11.4	5 34.6	9.860 6131	0.000 0253	9.996 713
	9	249 26 8.8	1 35 20.2	0 40.6	0 22 59.6	5 37.0	9.860 7603	9.993 3692	9.989 992
	11	252 36 45.2	1 35 16.3	−0 20.8	+0 11 43.9	−5 38.4	9.860 9029	9.986 5837	9.983 141
	13	255 47 14.0	1 35 12.6	−0 0.8	+0 0 26.6	5 38.8	9.861 0406	9.979 6661	9.976 156
	15	258 57 35.6	1 35 9.2	+0 19.2	−0 10 50.4	5 38.1	9.861 1730	9.972 6132	9.969 034
	17	262 7 50.7	1 35 6.1	0 39.0	0 22 5.0	5 36.4	9.861 2995	9.965 4214	9.961 772
	19	265 17 59.8	1 35 3.2	0 58.3	0 33 15.2	5 33.6	9.861 4199	9.958 0866	9.954 364
	21	268 28 3.4	1 35 0.6	+1 16.9	−0 44 18.9	−5 29.9	9.861 5338	9.950 6046	9.946 806
	23	271 38 2.2	1 34 58.3	1 34.5	0 55 14.2	5 25.2	9.861 6408	9.942 9706	9.939 095
	25	274 47 56.7	1 34 56.3	1 51.0	1 5 59.0	5 19.5	9.861 7407	9.935 1799	9.931 224
	27	277 57 47.5	1 34 54.6	2 6.1	1 16 31.5	5 12.9	9.861 8331	9.927 2285	9.923 191
	29	281 7 35.2	1 34 53.2	2 19.6	1 26 49.8	5 5.3	9.861 9178	9.919 1128	9.914 992
	31	284 17 20.3	1 34 52.0	+2 31.5	−1 36 51.9	−4 56.8	9.861 9945	9.910 8298	9.906 624
Sept.	2	287 27 3.5	1 34 51.2	2 41.5	1 46 36.2	4 47.4	9.862 0630	9.902 3762	9.898 084
	4	290 36 45.3	1 34 50.7	2 49.5	1 56 0.8	4 37.1	9.862 1231	9.893 7484	9.889 368
	6	293 46 26.3	1 34 50.4	2 55.5	2 5 4.1	4 26.0	9.862 1746	9.884 9429	9.880 472
	8	296 56 6.9	1 34 50.3	2 59.3	2 13 44.5	4 14.2	9.862 2173	9.875 9557	9.871 392
	10	300 5 47.7	1 34 50.5	+3 1.0	−2 22 0.4	−4 1.6	9.862 2512	9.866 7823	9.862 124
	12	303 15 29.2	1 34 51.0	3 0.4	2 29 50.3	3 48.2	9.862 2762	9.857 4174	9.852 661
	14	306 25 11.8	1 34 51.7	2 57.6	2 37 12.8	3 34.2	9.862 2921	9.847 8554	9.842 998
	16	309 34 55.9	1 34 52.5	2 52.7	2 44 6.7	3 19.6	9.862 2989	9.838 0903	9.833 129
	18	312 44 42.0	1 34 53.6	2 45.7	2 50 30.6	3 4.3	9.862 2966	9.828 1154	9.823 04
	20	315 54 30.5	1 34 54.9	+2 36.7	−2 56 23.4	−2 48.4	9.862 2853	9.817 9233	9.812 74
	22	319 4 21.8	1 34 56.4	2 25.8	3 1 44.0	2 32.1	9.862 2649	9.807 5065	9.802 21
	24	322 14 16.2	1 34 58.0	2 13.1	3 6 31.5	2 15.3	9.862 2355	9.796 8589	9.791 44
	26	325 24 14.0	1 34 59.8	1 58.7	3 10 44.9	1 58.0	9.862 1972	9.785 9750	9.780 44
	28	328 34 15.4	1 35 1.7	1 42.9	3 14 23.4	1 40.4	9.862 1501	9.774 8504	9.769 19
	30	331 44 20.8	1 35 3.7	+1 25.9	−3 17 26.5	−1 22.5	9.862 0944	9.763 4816	9.757 70
Oct.	2	334 54 30.4	1 35 5.9	+1 7.8	−3 19 53.4	−1 4.3	9.862 0301	9.751 8660	9.745 96

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 2	334 54 30.4	1 35 5.9	+1 7.8	−3 19 53.4	−1 4.3	9.862 0301	9.751 8660	9.745 9649
4	338 4 44.4	1 35 8.2	0 48.8	3 21 43.8	0 45.9	9.861 9576	9.740 0015	9.733 9756
6	341 15 3.1	1 35 10.5	0 29.3	3 22 57.2	0 27.4	9.861 8770	9.727 8871	9.721 7359
8	344 25 26.6	1 35 13.0	+0 9.4	3 23 33.5	−0 8.8	9.861 7885	9.715 5221	9.709 2458
10	347 35 55.0	1 35 15.5	−0 10.6	3 23 32.3	+0 9.9	9.861 6924	9.702 9071	9.696 5062
12	350 46 28.5	1 35 18.1	−0 30.5	−3 22 53.7	+0 28.6	9.861 5890	9.690 0438	9.683 5201
14	353 57 7.3	1 35 20.7	0 50.1	3 21 37.8	0 47.2	9.861 4787	9.676 9357	9.670 2913
16	357 7 51.5	1 35 23.4	1 9.0	3 19 44.7	1 5.8	9.861 3617	9.663 5878	9.656 8262
18	0 18 41.2	1 35 26.2	1 27.1	3 17 14.7	1 24.2	9.861 2384	9.650 0080	9.643 1349
20	3 29 36.5	1 35 29.0	1 44.2	3 14 8.2	1 42.3	9.861 1091	9.636 2087	9.629 2319
22	6 40 37.4	1 35 31.9	−1 59.9	−3 10 25.7	+2 0.1	9.860 9743	9.622 2072	9.615 1381
24	9 51 44.1	1 35 34.8	2 14.2	3 6 7.9	2 17.6	9.860 8344	9.608 0286	9.600 8835
26	13 2 56.7	1 35 37.8	2 26.9	3 1 15.4	2 34.7	9.860 6897	9.593 7081	9.586 5085
28	16 14 15.2	1 35 40.8	2 37.7	2 55 49.1	2 51.4	9.860 5407	9.579 2915	9.572 0644
30	19 25 39.8	1 35 43.8	2 46.6	2 49 50.0	3 7.6	9.860 3879	9.564 8355	9.557 6140
Nov. 1	22 37 10.5	1 35 46.9	−2 53.4	−2 43 19.1	+3 23.2	9.860 2318	9.550 4099	9.543 2342
3	25 48 47.4	1 35 50.0	2 58.1	2 36 17.5	3 38.2	9.860 0727	9.536 0990	9.529 0174
5	29 0 30.6	1 35 53.2	3 0.6	2 28 46.4	3 52.6	9.859 9113	9.522 0032	9.515 0715
7	32 12 20.1	1 35 56.4	3 0.8	2 20 47.3	4 6.3	9.859 7480	9.508 2386	9.501 5220
9	35 24 16.1	1 35 59.6	2 58.8	2 12 21.5	4 19.3	9.859 5833	9.494 9399	9.488 5117
11	38 36 18.6	1 36 2.9	−2 54.6	−2 3 30.6	+4 31.5	9.859 4177	9.482 2578	9.476 1991
13	41 48 27.7	1 36 6.2	2 48.2	1 54 16.2	4 42.8	9.859 2518	9.470 3576	9.464 7558
15	45 0 43.5	1 36 9.6	2 39.6	1 44 39.9	4 53.3	9.859 0861	9.459 4168	9.454 3640
17	48 13 6.2	1 36 13.0	2 29.0	1 34 43.6	5 2.9	9.858 9211	9.449 6209	9.445 2110
19	51 25 35.7	1 36 16.5	2 16.6	1 24 29.0	5 11.6	9.858 7573	9.441 1575	9.437 4828
21	54 38 12.2	1 36 20.0	−2 2.5	−1 13 58.0	+5 19.3	9.858 5952	9.434 2085	9.431 3547
23	57 50 55.7	1 36 23.5	1 46.8	1 3 12.6	5 26.0	9.858 4353	9.428 9396	9.426 9794
25	61 3 46.3	1 36 27.1	1 29.8	0 52 14.8	5 31.7	9.858 2782	9.425 4877	9.424 4752
27	64 16 44.1	1 36 30.7	1 11.6	0 41 6.7	5 36.3	9.858 1244	9.423 9491	9.423 9138
29	67 29 49.1	1 36 34.3	0 52.5	0 29 50.3	5 39.9	9.857 9744	9.424 3699	9.425 3145
Dec. 1	70 43 1.3	1 36 37.9	−0 32.7	−0 18 27.9	+5 42.4	9.857 8286	9.426 7415	9.428 6416
3	73 56 20.8	1 36 41.5	−0 12.5	−0 7 1.5	5 43.8	9.857 6875	9.431 0023	9.433 8084
5	77 9 47.5	1 36 45.1	+0 7.9	+0 4 26.7	5 44.2	9.857 5515	9.437 0419	9.440 6829
7	80 23 21.4	1 36 48.7	0 28.2	0 15 54.5	5 43.5	9.857 4212	9.444 7098	9.449 0997
9	83 37 2.5	1 36 52.3	0 48.1	0 27 19.7	5 41.6	9.857 2969	9.453 8287	9.458 8724
11	86 50 50.7	1 36 55.8	+1 7.5	+0 38 40.0	+5 38.6	9.857 1790	9.464 2055	9.469 8033
13	90 4 45.9	1 36 59.3	1 26.0	0 49 53.3	5 34.5	9.857 0679	9.475 6417	9.481 6969
15	93 18 48.0	1 37 2.7	1 43.4	1 0 57.4	5 29.4	9.856 9640	9.487 9461	9.494 3675
17	96 32 56.7	1 37 6.0	1 59.5	1 11 50.2	5 23.2	9.856 8676	9.500 9407	9.507 6465
19	99 47 11.9	1 37 9.2	2 14.1	1 22 29.5	5 15.9	9.856 7790	9.514 4666	9.521 3840
21	103 1 33.4	1 37 12.2	+2 26.9	+1 32 53.1	+5 7.6	9.856 6986	9.528 3830	9.535 4489
23	106 16 0.8	1 37 15.1	2 37.9	1 42 59.3	4 58.4	9.856 6265	9.542 5681	9.549 7280
25	109 30 33.9	1 37 17.9	2 46.9	1 52 45.9	4 48.1	9.856 5630	9.556 9170	9.564 1245
27	112 45 12.3	1 37 20.5	2 53.8	2 2 10.9	4 36.8	9.856 5084	9.571 3409	9.578 5570
29	115 59 55.6	1 37 22.8	2 58.4	2 11 12.6	4 24.7	9.856 4628	9.585 7646	9.592 9563
31	119 14 43.4	1 37 24.9	+3 0.7	+2 19 49.2	+4 11.7	9.856 4263	9.600 1254	9.607 2661
33	122 29 35.2	1 37 26.8	+3 0.7	+2 27 58.9	+3 57.9	9.856 3991	9.614 3728	9.621 4405

MARS.

GREENWICH MEAN NOON.

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	° ′ ″	′ ″	″	° ′ ″	″			
Jan. 1	102 36 10.9	28 18.04	+51.3	+1 29 29.2	+32.45	0.204 8631	9.794 1061	9.794 2213
3	103 32 42.7	28 13.76	50.8	1 30 33.3	31.63	0.205 4154	9.794 4902	9.794 9127
5	104 29 6.0	28 9.55	50.2	1 31 35.7	30.82	0.205 9596	9.795 4883	9.796 2164
7	105 25 20.9	28 5.39	49.5	1 32 36.5	30.01	0.206 4957	9.797 0959	9.798 1255
9	106 21 27.6	28 1.31	48.8	1 33 35.7	29.21	0.207 0237	9.799 3033	9.800 6277
11	107 17 26.2	27 57.31	+48.0	+1 34 33.3	+28.38	0.207 5434	9.802 0962	9.803 7064
13	108 13 16.9	27 53.41	47.2	1 35 29.2	27.54	0.208 0547	9.805 4555	9.807 3407
15	109 8 59.9	27 49.58	46.3	1 36 23.5	26.72	0.208 5575	9.809 3588	9.811 5067
17	110 4 35.3	27 45.80	45.4	1 37 16.1	25.93	0.209 0518	9.813 7809	9.816 1781
19	111 0 3.1	27 42.08	44.5	1 38 7.2	25.12	0.209 5375	9.818 6944	9.821 3260
21	111 55 23.6	27 38.46	+43.5	+1 38 56.6	+24.29	0.210 0144	9.824 0690	9.826 9192
23	112 50 37.0	27 34.92	42.5	1 39 44.3	23.46	0.210 4825	9.829 8723	9.832 9236
25	113 45 43.4	27 31.43	41.4	1 40 30.4	22.64	0.210 9418	9.836 0689	9.839 3037
27	114 40 42.9	27 28.03	40.2	1 41 14.8	21.82	0.211 3922	9.842 6234	9.846 0231
29	115 35 35.6	27 24.72	39.1	1 41 57.6	21.01	0.211 8336	9.849 4981	9.853 0438
31	116 30 21.8	27 21.47	+37.9	+1 42 38.8	+20.18	0.212 2659	9.856 6557	9.860 3295
Feb. 2	117 25 1.5	27 18.29	36.7	1 43 18.4	19.36	0.212 6890	9.864 0611	9.867 8461
4	118 19 34.9	27 15.19	35.4	1 43 56.3	18.54	0.213 1030	9.871 6800	9.875 5588
6	119 14 2.3	27 12.16	34.1	1 44 32.5	17.73	0.213 5077	9.879 4790	9.883 4370
8	120 8 23.7	27 9.21	32.8	1 45 7.1	16.91	0.213 9031	9.887 4289	9.891 4512
10	121 2 39.2	27 6.32	+31.4	+1 45 40.1	+16.09	0.214 2891	9.895 5009	9.899 5749
12	121 56 49.0	27 3.53	30.0	1 46 11.5	15.27	0.214 6656	9.903 6703	9.907 7845
14	122 50 53.3	27 0.81	28.6	1 46 41.2	14.46	0.215 0327	9.911 9151	9.916 0597
16	123 44 52.3	26 58.16	27.1	1 47 9.3	13.64	0.215 3902	9.920 2160	9.924 3817
18	124 38 46.1	26 55.58	25.7	1 47 35.8	12.83	0.215 7382	9.928 5545	9.932 7322
20	125 32 34.7	26 53.07	+24.2	+1 48 0.7	+12.02	0.216 0765	9.936 9127	9.941 0941
22	126 26 18.4	26 50.64	22.7	1 48 23.9	11.22	0.216 4052	9.945 2744	9.949 4515
24	127 19 57.3	26 48.29	21.1	1 48 45.5	10.41	0.216 7241	9.953 6238	9.957 7896
26	128 13 31.6	26 46.01	19.6	1 49 5.5	9.60	0.217 0332	9.961 9474	9.966 0955
28	129 7 1.4	26 43.81	18.0	1 49 23.9	8.79	0.217 3326	9.970 2323	9.974 3563
Mar. 2	130 0 26.9	26 41.69	+16.4	+1 49 40.7	+ 7.99	0.217 6222	9.978 4663	9.982 5611
4	130 53 48.2	26 39.64	14.8	1 49 55.8	7.18	0.217 9018	9.986 6397	9.990 7013
6	131 47 5.5	26 37.66	13.2	1 50 9.4	6.38	0.218 1715	9.994 7445	9.998 7684
8	132 40 18.9	26 35.74	11.6	1 50 21.4	5.58	0.218 4312	0.002 7724	0.006 7559
10	133 33 28.5	26 33.91	10.0	1 50 31.7	4.79	0.218 6810	0.010 7180	0.014 6582
12	134 26 34.6	26 32.16	+ 8.3	+1 50 40.5	+ 3.99	0.218 9208	0.018 5763	0.022 4718
14	135 19 37.2	26 30.48	6.7	1 50 47.7	3.19	0.219 1505	0.026 3445	0.030 1942
16	136 12 36.5	26 28.89	5.0	1 50 53.3	2.41	0.219 3701	0.034 0205	0.037 8232
18	137 5 32.7	26 27.36	3.4	1 50 57.3	1.62	0.219 5796	0.041 6019	0.045 3563
20	137 58 26.0	26 25.89	1.7	1 50 59.7	0.83	0.219 7790	0.049 0862	0.052 7916
22	138 51 16.4	26 24.51	+ 0.1	+1 51 0.6	+ 0.04	0.219 9684	0.056 4721	0.060 1269
24	139 44 4.1	26 23.21	− 1.6	1 50 59.9	− 0.75	0.220 1475	0.063 7560	0.067 3593
26	140 36 49.3	26 21.98	3.2	1 50 57.6	1.53	0.220 3163	0.070 9367	0.074 4877
28	141 29 32.1	26 20.81	4.9	1 50 53.8	2.31	0.220 4750	0.078 0122	0.081 5102
30	142 22 12.6	26 19.71	6.5	1 50 48.4	3.09	0.220 6235	0.084 9814	0.088 4255
Apr. 1	143 14 51.0	26 18.71	− 8.1	+1 50 41.4	− 3.87	0.220 7617	0.091 8426	0.095 2325

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Apr. 1	143 14 51.0	26 18.71	− 8.1	+1 50 41.4	− 3.87	0.220 7617	0.091 8426	0.095 2325
3	144 7 27.5	26 17.79	9.8	1 50 32.9	4.64	0.220 8896	0.098 5952	0.101 9307
5	145 0 2.2	26 16.94	11.4	1 50 22.9	5.41	0.221 0072	0.105 2390	0.108 5202
7	145 52 35.3	26 16.16	13.0	1 50 11.3	6.18	0.221 1146	0.111 7745	0.115 0019
9	146 45 6.9	26 15.44	14.6	1 49 58.1	6.95	0.221 2116	0.118 2025	0.121 3766
11	147 37 37.1	26 14.79	−16.1	+1 49 43.5	− 7.71	0.221 2984	0.124 5244	0.127 6461
13	148 30 6.1	26 14.23	17.7	1 49 27.3	8.48	0.221 3748	0.130 7420	0.133 8123
15	149 22 34.0	26 13.74	19.2	1 49 9.6	9.24	0.221 4408	0.136 8570	0.139 8763
17	150 15 1.1	26 13.33	20.8	1 48 50.3	10.00	0.221 4965	0.142 8703	0.145 8392
19	151 7 27.4	26 12.99	22.3	1 48 29.6	10.75	0.221 5419	0.148 7833	0.151 7024
21	151 59 53.1	26 12.73	−23.8	+1 48 7.3	−11.50	0.221 5769	0.154 5968	0.157 4662
23	152 52 18.4	26 12.54	25.2	1 47 43.6	12.26	0.221 6015	0.160 3106	0.163 1301
25	153 44 43.3	26 12.42	26.6	1 47 18.3	13.01	0.221 6158	0.165 9248	0.168 6948
27	154 37 8.1	26 12.39	28.0	1 46 51.5	13.75	0.221 6197	0.171 4403	0.174 1616
29	155 29 32.9	26 12.44	29.4	1 46 23.3	14.48	0.221 6133	0.176 8587	0.179 5314
May 1	156 21 57.9	26 12.53	−30.8	+1 45 53.6	−15.24	0.221 5965	0.182 1798	0.184 8040
3	157 14 23.1	26 12.68	32.1	1 45 22.4	15.97	0.221 5693	0.187 4041	0.189 9803
5	158 6 48.7	26 12.93	33.4	1 44 49.7	16.71	0.221 5317	0.192 5329	0.195 0621
7	158 59 14.9	26 13.29	34.7	1 44 15.5	17.44	0.221 4838	0.197 5682	0.200 0513
9	159 51 41.9	26 13.72	35.9	1 43 39.9	18.17	0.221 4256	0.202 5119	0.204 9500
11	160 44 9.8	26 14.19	−37.1	+1 43 2.8	−18.91	0.221 3570	0.207 3659	0.209 7600
13	161 36 38.7	26 14.71	38.3	1 42 24.3	19.63	0.221 2780	0.212 1326	0.214 4836
15	162 29 8.7	26 15.33	39.4	1 41 44.3	20.34	0.221 1888	0.216 8132	0.219 1216
17	163 21 40.1	26 16.05	40.5	1 41 2.9	21.06	0.221 0892	0.221 4091	0.223 6757
19	164 14 13.0	26 16.84	41.6	1 40 20.1	21.78	0.220 9793	0.225 9215	0.228 1465
21	165 6 47.5	26 17.69	−42.6	+1 39 35.8	−22.49	0.220 8591	0.230 3507	0.232 5343
23	165 59 23.8	26 18.61	43.6	1 38 50.1	23.20	0.220 7286	0.234 6974	0.236 8402
25	166 52 2.0	26 19.61	44.6	1 38 3.0	23.91	0.220 5879	0.238 9626	0.241 0647
27	167 44 42.3	26 20.71	45.5	1 37 14.5	24.62	0.220 4369	0.243 1466	0.245 2083
29	168 37 24.9	26 21.86	46.3	1 36 24.6	25.31	0.220 2757	0.247 2501	0.249 2720
31	169 30 9.8	26 23.07	−47.1	+1 35 33.2	−26.01	0.220 1042	0.251 2740	0.253 2564
June 2	170 22 57.2	26 24.37	47.9	1 34 40.5	26.71	0.219 9226	0.255 2194	0.257 1630
4	171 15 47.3	26 25.77	48.6	1 33 46.4	27.40	0.219 7308	0.259 0875	0.260 9931
6	172 8 40.3	26 27.22	49.3	1 32 50.9	28.09	0.219 5288	0.262 8800	0.264 7484
8	173 1 36.2	26 28.72	50.0	1 31 54.1	28.78	0.219 3167	0.266 5986	0.268 4308
10	173 54 35.2	26 30.31	−50.5	+1 30 55.8	−29.46	0.219 0945	0.270 2452	0.272 0419
12	174 47 37.5	26 32.00	51.1	1 29 56.2	30.13	0.218 8622	0.273 8211	0.275 5829
14	175 40 43.3	26 33.76	51.6	1 28 55.3	30.80	0.218 6199	0.277 3275	0.279 0549
16	176 33 52.6	26 35.59	52.0	1 27 53.0	31.47	0.218 3676	0.280 7653	0.282 4586
18	177 27 5.7	26 37.49	52.4	1 26 49.4	32.14	0.218 1053	0.284 1349	0.285 7943
20	178 20 22.6	26 39.47	−52.8	+1 25 44.5	−32.80	0.217 8330	0.287 4369	0.289 0628
22	179 13 43.6	26 41.54	53.1	1 24 38.2	33.46	0.217 5508	0.290 6721	0.292 2647
24	180 7 8.8	26 43.66	53.3	1 23 30.6	34.11	0.217 2588	0.293 8407	0.295 4001
26	181 0 38.3	26 45.84	53.5	1 22 21.8	34.76	0.216 9569	0.296 9429	0.298 4692
28	181 54 12.2	26 48.11	53.7	1 21 11.6	35.41	0.216 6452	0.299 9792	0.301 4731
30	182 47 50.8	26 50.48	−53.8	+1 20 0.1	−36.05	0.216 3237	0.302 9509	0.304 4128
July 2	183 41 34.2	26 52.94	−53.8	+1 18 47.4	−36.69	0.215 9925	0.305 8588	0.307 2891

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July 2	183 41 34.2	26 52.94	−53.8	+1 18 47.4	−36.69	0.215 9925	0.305 8588	0.307 2891
4	184 35 22.6	26 55.44	53.8	1 17 33.4	37.32	0.215 6516	0.308 7039	0.310 1034
6	185 29 16.0	26 58.00	53.7	1 16 18.1	37.95	0.215 3011	0.311 4878	0.312 8572
8	186 23 14.6	27 0.66	53.6	1 15 1.6	38.57	0.214 9410	0.314 2118	0.315 5518
10	187 17 18.7	27 3.40	53.4	1 13 43.8	39.19	0.214 5713	0.316 8773	0.318 1885
12	188 11 28.3	27 6.20	−53.2	+1 12 24.8	−39.80	0.214 1922	0.319 4854	0.320 7679
14	189 5 43.6	27 9.09	52.9	1 11 4.6	40.41	0.213 8037	0.322 0361	0.323 2901
16	190 0 4.7	27 12.05	52.6	1 9 43.2	41.01	0.213 4058	0.324 5302	0.325 7566
18	190 54 31.8	27 15.07	52.2	1 8 20.5	41.61	0.212 9986	0.326 9689	0.328 1672
20	191 49 5.0	27 18.19	51.8	1 6 56.7	42.20	0.212 5821	0.329 3515	0.330 5221
22	192 43 44.6	27 21.39	−51.3	+1 5 31.7	−42.78	0.212 1564	0.331 6788	0.332 8216
24	193 38 30.6	27 24.65	50.7	1 4 5.6	43.36	0.211 7216	0.333 9506	0.335 0658
26	194 33 23.2	27 27.98	50.1	1 2 38.3	43.94	0.211 2777	0.336 1675	0.337 2555
28	195 28 22.6	27 31.39	49.5	1 1 9.8	44.51	0.210 8249	0.338 3299	0.339 3909
30	196 23 28.8	27 34.87	48.8	0 59 40.3	45.07	0.210 3631	0.340 4385	0.341 4728
Aug. 1	197 18 42.1	27 38.44	−48.0	+0 58 9.6	−45.62	0.209 8924	0.342 4940	0.343 5024
3	198 14 2.6	27 42.09	47.2	0 56 37.8	46.17	0.209 4129	0.344 4981	0.345 4812
5	199 9 30.5	27 45.81	46.4	0 55 4.9	46.72	0.208 9248	0.346 4518	0.347 4101
7	200 5 5.9	27 49.61	45.4	0 53 30.9	47.24	0.208 4281	0.348 3561	0.349 2899
9	201 0 49.0	27 53.46	44.5	0 51 55.9	47.76	0.207 9228	0.350 2116	0.351 1213
11	201 56 39.8	27 57.39	−43.5	+0 50 19.9	−48.28	0.207 4091	0.352 0190	0.352 9049
13	202 52 38.6	28 1.41	42.4	0 48 42.8	48.80	0.206 8870	0.353 7790	0.354 6413
15	203 48 45.5	28 5.49	41.3	0 47 4.7	49.30	0.206 3566	0.355 4917	0.356 3302
17	204 45 0.6	28 9.64	40.2	0 45 25.6	49.79	0.205 8180	0.357 1570	0.357 9721
19	205 41 24.1	28 13.89	39.0	0 43 45.5	50.28	0.205 2714	0.358 7755	0.359 5672
21	206 37 56.2	28 18.21	−37.7	+0 42 4.5	−50.76	0.204 7167	0.360 3472	0.361 1156
23	207 34 37.0	28 22.59	36.4	0 40 22.5	51.23	0.204 1542	0.361 8723	0.362 6173
25	208 31 26.6	28 27.04	35.1	0 38 39.6	51.68	0.203 5839	0.363 3507	0.364 0726
27	209 28 25.2	28 31.56	33.7	0 36 55.8	52.13	0.203 0059	0.364 7831	0.365 4823
29	210 25 32.9	28 36.16	32.3	0 35 11.1	52.57	0.202 4204	0.366 1704	0.366 8473
31	211 22 49.9	28 40.84	−30.9	+0 33 25.5	−53.00	0.201 8274	0.367 5132	0.368 1683
Sept. 2	212 20 16.3	28 45.59	29.4	0 31 39.0	53.42	0.201 2271	0.368 8128	0.369 4468
4	213 17 52.3	28 50.41	27.9	0 29 51.8	53.83	0.200 6196	0.370 0703	0.370 6834
6	214 15 38.0	28 55.29	26.3	0 28 3.7	54.23	0.200 0051	0.371 2862	0.371 8787
8	215 13 33.5	29 0.24	24.7	0 26 14.9	54.62	0.199 3837	0.372 4610	0.373 0332
10	216 11 39.0	29 5.26	−23.1	+0 24 25.3	−55.00	0.198 7553	0.373 5952	0.374 1472
12	217 9 54.6	29 10.36	21.4	0 22 34.9	55.36	0.198 1201	0.374 6891	0.375 2210
14	218 8 20.5	29 15.54	19.7	0 20 43.8	55.71	0.197 4784	0.375 7429	0.376 2548
16	219 6 56.8	29 20.79	18.0	0 18 52.1	56.05	0.196 8304	0.376 7567	0.377 2486
18	220 5 43.7	29 26.09	16.3	0 16 59.6	56.38	0.196 1761	0.377 7306	0.378 2025
20	221 4 41.2	29 31.44	−14.5	+0 15 6.6	−56.69	0.195 5157	0.378 6644	0.379 1162
22	222 3 49.5	29 36.86	12.7	0 13 12.9	56.99	0.194 8493	0.379 5581	0.379 9901
24	223 3 8.7	29 42.36	10.9	0 11 18.7	57.28	0.194 1771	0.380 4123	0.380 8248
26	224 2 39.0	29 47.94	9.1	0 9 23.8	57.55	0.193 4993	0.381 2277	0.381 6211
28	225 2 20.5	29 53.59	7.2	0 7 28.5	57.81	0.192 8160	0.382 0051	0.382 3798
30	226 2 13.4	29 59.27	− 5.4	+0 5 32.6	−58.05	0.192 1274	0.382 7453	0.383 1017
Oct. 2	227 2 17.7	30 5.02	− 3.5	+0 3 36.3	−58.28	0.191 4336	0.383 4492	0.383 7877

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
Oct. 2	227 2 17.7	30 5.02	− 3.5	+0 3 36.3	−58.28	0.191 4336	0.383 4492	0.383 7877
4	228 2 33.5	30 10.84	− 1.6	+0 1 39.5	58.49	0.190 7348	0.384 1174	0.384 4384
6	229 3 1.0	30 16.71	+ 0.3	−0 0 17.7	58.68	0.190 0313	0.384 7508	0.385 0546
8	230 3 40.3	30 22.65	2.2	0 2 15.2	58.86	0.189 3232	0.385 3498	0.385 6364
10	231 4 31.6	30 28.64	4.1	0 4 13.1	59.02	0.188 6107	0.385 9145	0.386 1842
12	232 5 34.9	30 34.67	+ 6.0	−0 6 11.3	−59.17	0.187 8940	0.386 4454	0.386 6981
14	233 6 50.3	30 40.77	7.9	0 8 9.8	59.30	0.187 1733	0.386 9424	0.387 1783
16	234 8 18.0	30 46.94	9.8	0 10 8.5	59.41	0.186 4487	0.387 4057	0.387 6246
18	235 9 58.1	30 53.15	11.7	0 12 7.4	59.50	0.185 7205	0.387 8351	0.388 0371
20	236 11 50.6	30 59.40	13.6	0 14 6.5	59.57	0.184 9890	0.388 2307	0.388 4159
22	237 13 55.7	31 5.72	+15.4	−0 16 5.7	−59.63	0.184 2543	0.388 5928	0.388 7613
24	238 16 13.5	31 12.10	17.3	0 18 5.0	59.66	0.183 5166	0.388 9215	0.389 0737
26	239 18 44.1	31 18.50	19.1	0 20 4.4	59.69	0.182 7761	0.389 2180	0.389 3546
28	240 21 27.5	31 24.92	20.9	0 22 3.7	59.67	0.182 0332	0.389 4835	0.389 6048
30	241 24 23.8	31 31.42	22.7	0 24 3.0	59.64	0.181 2880	0.389 7185	0.389 8248
Nov. 1	242 27 33.2	31 37.97	+24.5	−0 26 2.3	−59.59	0.180 5408	0.389 9237	0.390 0153
3	243 30 55.7	31 44.54	26.3	0 28 1.4	59.52	0.179 7917	0.390 0997	0.390 1771
5	244 34 31.4	31 51.15	28.0	0 30 0.4	59.43	0.179 0411	0.390 2474	0.390 3107
7	245 38 20.3	31 57.80	29.7	0 31 59.1	59.31	0.178 2892	0.390 3670	0.390 4163
9	246 42 22.6	32 4.47	31.3	0 33 57.6	59.18	0.177 5363	0.390 4588	0.390 4944
11	247 46 38.2	32 11.18	+32.9	−0 35 55.8	−59.02	0.176 7826	0.390 5231	0.390 5449
13	248 51 7.3	32 17.94	34.5	0 37 53.7	58.84	0.176 0284	0.390 5597	0.390 5676
15	249 55 50.0	32 24.72	36.0	0 39 51.2	58.63	0.175 2739	0.390 5687	0.390 5629
17	251 0 46.2	32 31.50	37.5	0 41 48.2	58.39	0.174 5195	0.390 5503	0.390 5309
19	252 5 56.0	32 38.30	39.0	0 43 44.7	58.13	0.173 7654	0.390 5047	0.390 4717
21	253 11 19.4	32 45.14	+40.4	−0 45 40.7	−57.85	0.173 0119	0.390 4320	0.390 3858
23	254 16 56.5	32 51.97	41.7	0 47 36.1	57.54	0.172 2592	0.390 3332	0.390 2742
25	255 22 47.3	32 58.85	42.9	0 49 30.9	57.20	0.171 5077	0.390 2090	0.390 1378
27	256 28 51.9	33 5.74	44.1	0 51 24.9	56.84	0.170 7577	0.390 0606	0.389 9775
29	257 35 10.3	33 12.62	45.3	0 53 18.2	56.44	0.170 0094	0.389 8887	0.389 7943
Dec. 1	258 41 42.4	33 19.52	+46.4	−0 55 10.7	−56.03	0.169 2632	0.389 6942	0.389 5886
3	259 48 28.4	33 26.43	47.4	0 57 2.3	55.59	0.168 5194	0.389 4775	0.389 3609
5	260 55 28.2	33 33.32	48.4	0 58 53.1	55.12	0.167 7782	0.389 2389	0.389 1116
7	262 2 41.7	33 40.20	49.3	1 0 42.8	54.62	0.167 0400	0.388 9792	0.388 8417
9	263 10 9.0	33 47.10	50.1	1 2 31.5	54.09	0.166 3052	0.388 6990	0.388 5510
11	264 17 50.1	33 53.98	+50.8	−1 4 19.2	−53.53	0.165 5740	0.388 3979	0.388 2396
13	265 25 44.9	34 0.84	51.5	1 6 5.7	52.95	0.164 8467	0.388 0761	0.387 9074
15	266 33 53.4	34 7.70	52.0	1 7 51.0	52.33	0.164 1236	0.387 7334	0.387 5542
17	267 42 15.6	34 14.53	52.5	1 9 35.0	51.69	0.163 4052	0.387 3699	0.387 1807
19	268 50 51.5	34 21.31	53.0	1 11 17.7	51.02	0.162 6917	0.386 9865	0.386 7874
21	269 59 40.9	34 28.08	+53.3	−1 12 59.1	−50.32	0.161 9834	0.386 5834	0.386 3747
23	271 8 43.8	34 34.83	53.5	1 14 39.0	49.59	0.161 2807	0.386 1614	0.385 9438
25	272 18 0.2	34 41.55	53.7	1 16 17.4	48.83	0.160 5840	0.385 7219	0.385 4958
27	273 27 30.0	34 48.23	53.8	1 17 54.3	48.04	0.159 8935	0.385 2655	0.385 0312
29	274 37 13.1	34 54.86	53.8	1 19 29.6	47.21	0.159 2097	0.384 7930	0.384 5509
31	275 47 9.4	35 1.44	+53.7	−1 21 3.2	−46.37	0.158 5328	0.384 3051	0.384 0556
33	276 57 18.8	35 7.98	+53.5	−1 22 35.1	−45.49	0.157 8631	0.383 8023	0.383 5455

JUPITER.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
								At Date.	At Interm diate Dat
		° ′ ″	′ ″	″	° ′ ″	″			
Jan.	1	298 8 11.5	5 7.86	+16.2	−0 25 1.8	−6.67	0.709 7869	0.783 1444	0.783 65
	5	298 28 43.3	5 8.03	16.5	0 25 28.4	6.65	0.709 6683	0.784 1096	0.784 50
	9	298 49 15.8	5 8.20	16.7	0 25 55.0	6.64	0.709 5498	0.784 8333	0.785 10
	13	299 9 49.0	5 8.37	17.0	0 26 21.6	6.63	0.709 4315	0.785 3158	0.785 46
	17	299 30 22.9	5 8.54	17.2	0 26 48.1	6.62	0.709 3134	0.785 5573	0.785 58
	21	299 50 57.4	5 8.70	+17.5	−0 27 14.6	−6.61	0.709 1955	0.785 5565	0.785 46
	25	300 11 32.6	5 8.87	17.7	0 27 41.0	6.60	0.709 0777	0.785 3118	0.785 09
	29	300 32 8.4	5 9.04	17.9	0 28 7.4	6.59	0.708 9601	0.784 8231	0.784 48
Feb.	2	300 52 44.9	5 9.21	18.2	0 28 33.8	6.58	0.708 8427	0.784 0916	0.783 63
	6	301 13 22.1	5 9.37	18.4	0 29 0.0	6.57	0.708 7255	0.783 1190	0.782 54
	10	301 33 59.9	5 9.54	+18.7	−0 29 26.3	−6.55	0.708 6085	0.781 9081	0.781 213
	14	301 54 38.4	5 9.71	18.9	0 29 52.5	6.54	0.708 4917	0.780 4603	0.779 648
	18	302 15 17.6	5 9.88	19.1	0 30 18.6	6.53	0.708 3751	0.778 7767	0.777 846
	22	302 35 57.5	5 10.05	19.3	0 30 44.7	6.52	0.708 2588	0.776 8573	0.775 809
	26	302 56 38.0	5 10.22	19.6	0 31 10.7	6.50	0.708 1427	0.774 7038	0.773 540
Mar.	2	303 17 19.2	5 10.38	+19.8	−0 31 36.7	−6.49	0.708 0268	0.772 3194	0.771 041
	6	303 38 1.1	5 10.55	20.0	0 32 2.6	6.48	0.707 9111	0.769 7078	0.768 318
	10	303 58 43.6	5 10.71	20.2	0 32 28.5	6.47	0.707 7956	0.766 8742	0.765 375
	14	304 19 26.8	5 10.88	20.4	0 32 54.3	6.45	0.707 6804	0.763 8223	0.762 215
	18	304 40 10.6	5 11.04	20.6	0 33 20.1	6.44	0.707 5654	0.760 5551	0.758 841
	22	305 0 55.1	5 11.20	+20.8	−0 33 45.8	−6.42	0.707 4507	0.757 0756	0.755 257
	26	305 21 40.2	5 11.36	21.0	0 34 11.4	6.40	0.707 3362	0.753 3881	0.751 4681
	30	305 42 26.0	5 11.53	21.2	0 34 37.0	6.38	0.707 2219	0.749 4986	0.747 4807
Apr.	3	306 3 12.5	5 11.69	21.4	0 35 2.5	6.37	0.707 1079	0.745 4154	0.743 3036
	7	306 23 59.6	5 11.86	21.6	0 35 28.0	6.35	0.706 9941	0.741 1463	0.738 9445
	11	306 44 47.4	5 12.02	+21.8	−0 35 53.4	−6.34	0.706 8806	0.736 6992	0.734 4112
	15	307 5 35.8	5 12.19	22.0	0 36 18.7	6.32	0.706 7674	0.732 0814	0.729 7108
	19	307 26 24.9	5 12.35	22.2	0 36 43.9	6.31	0.706 6545	0.727 3006	0.724 8518
	23	307 47 14.6	5 12.52	22.4	0 37 9.1	6.29	0.706 5418	0.722 3663	0.719 8455
	27	308 8 5.0	5 12.68	22.6	0 37 34.2	6.27	0.706 4295	0.717 2912	0.714 7049
May	1	308 28 56.0	5 12.84	+22.8	−0 37 59.3	−6.25	0.706 3175	0.712 0887	0.709 4444
	5	308 49 47.7	5 13.00	22.9	0 38 24.3	6.24	0.706 2058	0.706 7742	0.704 0799
	9	309 10 40.0	5 13.16	23.1	0 38 49.2	6.22	0.706 0943	0.701 3635	0.698 6267
	13	309 31 33.0	5 13.32	23.2	0 39 14.0	6.20	0.705 9832	0.695 8715	0.693 0999
	17	309 52 26.6	5 13.48	23.4	0 39 38.8	6.18	0.705 8724	0.690 3144	0.687 5174
	21	310 13 20.9	5 13.64	+23.6	−0 40 3.4	−6.16	0.705 7620	0.684 7117	0.681 8999
	25	310 34 15.8	5 13.80	23.7	0 40 28.0	6.14	0.705 6518	0.679 0853	0.676 2712
	29	310 55 11.3	5 13.96	23.9	0 40 52.6	6.12	0.705 5420	0.673 4607	0.670 6569
June	2	311 16 7.5	5 14.12	24.0	0 41 17.0	6.10	0.705 4324	0.667 8636	0.665 0842
	6	311 37 4.3	5 14.28	24.2	0 41 41.4	6.08	0.705 3232	0.662 3219	0.659 5797
	10	311 58 1.7	5 14.44	+24.3	−0 42 5.7	−6.06	0.705 2144	0.656 8612	0.654 1698
	14	312 18 59.8	5 14.59	24.4	0 42 29.9	6.04	0.705 1059	0.651 5095	0.648 8842
	18	312 39 58.5	5 14.75	24.6	0 42 54.0	6.02	0.704 9977	0.646 2983	0.643 7560
	22	313 0 57.8	5 14.91	24.7	0 43 18.1	6.00	0.704 8899	0.641 2618	0.638 8200
	26	313 21 57.8	5 15.07	24.8	0 43 42.0	5.98	0.704 7825	0.636 4352	0.634 1121
	30	313 42 58.4	5 15.22	+25.0	−0 44 5.9	−5.96	0.704 6754	0.631 8548	0.629 6675
July	4	314 3 59.6	5 15.38	+25.1	−0 44 29.7	−5.94	0.704 5686	0.627 5542	0.625 5101

JUPITER.

GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 4	314 3 59.6	5 15.38	+25.1	−0 44 29.7	−5.94	0.704 5686	0.627 5542	0.625 5191
8	314 25 1.4	5 15.53	25.2	0 44 53.4	5.92	0.704 4622	0.623 5660	0.621 6986
12	314 46 3.9	5 15.69	25.3	0 45 17.0	5.89	0.704 3561	0.619 9213	0.618 2380
16	315 7 7.0	5 15.84	25.4	0 45 40.5	5.87	0.704 2505	0.616 6526	0.615 1690
20	315 28 10.7	5 16.00	25.5	0 46 4.0	5.84	0.704 1452	0.613 7910	0.612 5225
24	315 49 15.0	5 16.15	+25.6	−0 46 27.3	−5.82	0.704 0404	0.611 3665	0.610 3261
28	316 10 19.9	5 16.31	25.7	0 46 50.5	5.80	0.703 9359	0.609 4037	0.608 6017
Aug. 1	316 31 25.5	5 16.46	25.8	0 47 13.7	5.78	0.703 8319	0.607 9217	0.607 3653
5	316 52 31.7	5 16.62	25.9	0 47 36.7	5.75	0.703 7282	0.606 9335	0.606 6274
9	317 13 38.5	5 16.77	26.0	0 47 59.6	5.73	0.703 6249	0.606 4478	0.606 3955
13	317 34 45.8	5 16.92	+26.1	−0 48 22.5	−5.70	0.703 5220	0.606 4706	0.606 6736
17	317 55 53.8	5 17.07	26.1	0 48 45.2	5.68	0.703 4196	0.607 0040	0.607 4613
21	318 17 2.4	5 17.22	26.2	0 49 7.9	5.65	0.703 3175	0.608 0444	0.608 7520
25	318 38 11.6	5 17.37	26.3	0 49 30.5	5.63	0.703 2158	0.609 5819	0.610 5320
29	318 59 21.4	5 17.52	26.4	0 49 52.9	5.60	0.703 1146	0.611 5994	0.612 7812
Sept. 2	319 20 31.7	5 17.67	+26.4	−0 50 15.3	−5.58	0.703 0138	0.614 0742	0.615 4751
6	319 41 42.6	5 17.81	26.5	0 50 37.5	5.55	0.702 9135	0.616 9807	0.618 5876
10	320 2 54.2	5 17.96	26.5	0 50 59.6	5.52	0.702 8136	0.620 2923	0.622 0913
14	320 24 6.3	5 18.11	26.6	0 51 21.7	5.49	0.702 7142	0.623 9806	0.625 9564
18	320 45 19.0	5 18.26	26.6	0 51 43.6	5.47	0.702 6152	0.628 0143	0.630 1501
22	321 6 32.3	5 18.40	+26.7	−0 52 5.4	−5.44	0.702 5166	0.632 3592	0.634 6370
26	321 27 46.2	5 18.55	26.7	0 52 27.1	5.41	0.702 4185	0.636 9785	0.639 3787
30	321 49 0.7	5 18.69	26.7	0 52 48.7	5.38	0.702 3208	0.641 8335	0.644 3384
Oct. 4	322 10 15.8	5 18.83	26.8	0 53 10.2	5.36	0.702 2236	0.646 8892	0.649 4813
8	322 31 31.4	5 18.97	26.8	0 53 31.6	5.33	0.702 1268	0.652 1111	0.654 7747
12	322 52 47.6	5 19.11	+26.8	−0 53 52.8	−5.30	0.702 0306	0.657 4681	0.660 1872
16	323 14 4.3	5 19.25	26.8	0 54 14.0	5.27	0.701 9348	0.662 9281	0.665 6871
20	323 35 21.6	5 19.39	26.8	0 54 35.0	5.24	0.701 8394	0.668 4602	0.671 2433
24	323 56 39.4	5 19.53	26.9	0 54 56.0	5.21	0.701 7446	0.674 0327	0.676 8246
28	324 17 57.8	5 19.67	26.9	0 55 16.8	5.18	0.701 6503	0.679 6158	0.682 4032
Nov. 1	324 39 16.8	5 19.82	+26.9	−0 55 37.4	−5.15	0.701 5564	0.685 1839	0.687 9551
5	325 0 36.4	5 19.96	26.9	0 55 58.0	5.12	0.701 4630	0.690 7139	0.693 4580
9	325 21 56.5	5 20.09	26.9	0 56 18.4	5.09	0.701 3701	0.696 1851	0.698 8926
13	325 43 17.1	5 20.23	26.9	0 56 38.8	5.06	0.701 2778	0.701 5784	0.704 2397
17	326 4 38.3	5 20.36	26.9	0 56 59.0	5.03	0.701 1859	0.706 8743	0.709 4798
21	326 26 0.0	5 20.50	+26.8	−0 57 19.1	−5.00	0.701 0946	0.712 0541	0.714 5948
25	326 47 22.3	5 20.63	26.8	0 57 39.0	4.97	0.701 0037	0.717 1004	0.719 5691
29	327 8 45.1	5 20.76	26.8	0 57 58.8	4.94	0.700 9134	0.721 9996	0.724 3903
Dec. 3	327 30 8.4	5 20.90	26.7	0 58 18.5	4.91	0.700 8237	0.726 7401	0.729 0476
7	327 51 32.3	5 21.03	26.7	0 58 38.1	4.88	0.700 7344	0.731 3117	0.733 5314
11	328 12 56.7	5 21.16	+26.6	−0 58 57.5	−4.84	0.700 6457	0.735 7053	0.737 8324
15	328 34 21.6	5 21.29	26.6	0 59 16.8	4.81	0.700 5575	0.739 9112	0.741 9407
19	328 55 47.0	5 21.42	26.5	0 59 36.0	4.78	0.700 4699	0.743 9198	0.745 8471
23	329 17 13.0	5 21.55	26.5	0 59 55.0	4.75	0.700 3828	0.747 7220	0.749 5438
27	329 38 39.5	5 21.68	26.4	1 0 14.0	4.71	0.700 2962	0.751 3120	0.753 0260
31	330 0 6.5	5 21.81	+26.4	−1 0 32.8	−4.68	0.700 2102	0.754 6854	0.756 2898
35	330 21 34.0	5 21.94	+26.3	−1 0 51.4	−4.65	0.700 1248	0.757 8388	

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Interm diate Dat
	° ′ ″	′ ″	′ ″	° ′ ″	″			
Jan. 1	75 36 27.1	2 14.21	−1 34.0	−1 30 42.3	+4.64	0.955 7315	0.911 0469	0.911 89
5	75 45 23.9	2 14.22	1 33.9	1 30 23.7	4.65	0.955 7155	0.912 8058	0.913 76
9	75 54 20.8	2 14.22	1 33.7	1 30 5.1	4.65	0.955 6998	0.914 7819	0.915 84
13	76 3 17.7	2 14.22	1 33.6	1 29 46.5	4.66	0.955 6843	0.916 9593	0.918 11
17	76 12 14.6	2 14.24	1 33.4	1 29 27.8	4.67	0.955 6688	0.919 3223	0.920 56
21	76 21 11.6	2 14.26	−1 33.3	−1 29 9.1	+4.68	0.955 6535	0.921 8548	0.923 17
25	76 30 8.7	2 14.27	1 33.1	1 28 50.3	4.70	0.955 6383	0.924 5398	0.925 93
29	76 39 5.8	2 14.28	1 33.0	1 28 31.5	4.71	0.955 6231	0.927 3585	0.928 81
Feb. 2	76 48 2.9	2 14.29	1 32.8	1 28 12.7	4.71	0.955 6080	0.930 2911	0.931 79
6	76 57 0.1	2 14.30	1 32.7	1 27 53.8	4.72	0.955 5931	0.933 3186	0.934 86
10	77 5 57.3	2 14.30	−1 32.5	−1 27 34.9	+4.72	0.955 5784	0.936 4222	0.937 99
14	77 14 54.5	2 14.31	1 32.4	1 27 16.0	4.74	0.955 5639	0.939 5844	0.941 18
18	77 23 51.8	2 14.31	1 32.2	1 26 57.0	4.75	0.955 5495	0.942 7894	0.944 40
22	77 32 49.0	2 14.32	1 32.1	1 26 38.0	4.76	0.955 5354	0.946 0202	0.947 639
26	77 41 46.3	2 14.34	1 31.9	1 26 18.9	4.77	0.955 5214	0.949 2595	0.950 877
Mar. 2	77 50 43.7	2 14.35	−1 31.7	−1 25 59.8	+4.78	0.955 5076	0.952 4914	0.954 09
6	77 59 41.1	2 14.35	1 31.6	1 25 40.7	4.79	0.955 4939	0.955 7000	0.957 291
10	78 8 38.5	2 14.36	1 31.4	1 25 21.5	4.80	0.955 4803	0.958 8715	0.960 439
14	78 17 36.0	2 14.37	1 31.2	1 25 2.3	4.80	0.955 4668	0.961 9932	0.963 53
18	78 26 33.5	2 14.38	1 31.0	1 24 43.1	4.81	0.955 4536	0.965 0547	0.966 559
22	78 35 31.0	2 14.39	−1 30.8	−1 24 23.8	+4.82	0.955 4405	0.968 0443	0.969 50
26	78 44 28.6	2 14.40	1 30.6	1 24 4.5	4.83	0.955 4276	0.970 9514	0.972 370
30	78 53 26.2	2 14.40	1 30.4	1 23 45.2	4.84	0.955 4148	0.973 7653	0.975 134
Apr. 3	79 2 23.8	2 14.41	1 30.2	1 23 25.8	4.85	0.955 4023	0.976 4757	0.977 789
7	79 11 21.5	2 14.42	1 30.0	1 23 6.4	4.86	0.955 3898	0.979 0751	0.980 331
11	79 20 19.2	2 14.43	−1 29.8	−1 22 46.9	+4.87	0.955 3775	0.981 5570	0.982 752
15	79 29 16.9	2 14.44	1 29.6	1 22 27.4	4.88	0.955 3654	0.983 9157	0.985 047
19	79 38 14.7	2 14.45	1 29.4	1 22 7.9	4.88	0.955 3534	0.986 1452	0.987 209
23	79 47 12.5	2 14.45	1 29.2	1 21 48.4	4.89	0.955 3416	0.988 2397	0.989 234
27	79 56 10.3	2 14.45	1 29.0	1 21 28.8	4.90	0.955 3299	0.990 1929	0.991 115
May 1	80 5 8.1	2 14.46	−1 28.8	−1 21 9.2	+4.91	0.955 3184	0.992 0002	0.992 848
5	80 14 6.0	2 14.47	1 28.6	1 20 49.5	4.92	0.955 3070	0.993 6583	0.994 430
9	80 23 3.9	2 14.48	1 28.4	1 20 29.8	4.93	0.955 2958	0.995 1642	0.995 859
13	80 32 1.8	2 14.48	1 28.2	1 20 10.1	4.94	0.955 2847	0.996 5161	0.997 133
17	80 40 59.7	2 14.49	1 28.0	1 19 50.3	4.94	0.955 2738	0.997 7117	0.998 249
21	80 49 57.7	2 14.50	−1 27.7	−1 19 30.5	+4.95	0.955 2630	0.998 7480	0.999 205
25	80 58 55.7	2 14.50	1 27.5	1 19 10.7	4.96	0.955 2524	0.999 6225	0.999 998
29	81 7 53.7	2 14.51	1 27.3	1 18 50.9	4.96	0.955 2418	1.000 3333	1.000 627
June 2	81 16 51.8	2 14.52	1 27.0	1 18 31.0	4.97	0.955 2314	1.000 8797	1.001 091
6	81 25 49.9	2 14.53	1 26.8	1 18 11.1	4.98	0.955 2212	1.001 2615	1.001 391
10	81 34 48.0	2 14.54	−1 26.6	−1 17 51.1	+5.00	0.955 2112	1.001 4795	1.001 5269
14	81 43 46.2	2 14.54	1 26.3	1 17 31.1	5.00	0.955 2013	1.001 5332	1.001 4982
18	81 52 44.3	2 14.54	1 26.1	1 17 11.1	5.01	0.955 1916	1.001 4219	1.001 3043
22	82 1 42.5	2 14.55	1 25.8	1 16 51.0	5.01	0.955 1822	1.001 1454	1.000 9453
26	82 10 40.7	2 14.55	1 25.6	1 16 31.0	5.02	0.955 1728	1.000 7040	1.000 4216
30	82 19 38.9	2 14.55	−1 25.4	−1 16 10.8	+5.04	0.955 1635	1.000 0984	0.999 7348
July 4	82 28 37.1	2 14.56	−1 25.1	−1 15 50.7	+5.04	0.955 1543	0.999 3310	0.998 8874

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
July 4	82 28 37.1	2 14.56	−1 25.1	−1 15 50.7	+5.04	0.955 1543	0.999 3310	0.998 8874
8	82 37 35.4	2 14.57	1 24.9	1 15 30.5	5.05	0.955 1453	0.998 4041	0.997 8812
12	82 46 33.7	2 14.58	1 24.6	1 15 10.3	5.06	0.955 1364	0.997 3190	0.996 7177
16	82 55 32.0	2 14.59	1 24.4	1 14 50.0	5.06	0.955 1276	0.996 0776	0.995 3987
20	83 4 30.4	2 14.59	1 24.2	1 14 29.8	5.06	0.955 1190	0.994 6813	0.993 9258
24	83 13 28.7	2 14.60	−1 23.9	−1 14 9.5	+5.08	0.955 1106	0.993 1326	0.992 3021
28	83 22 27.1	2 14.60	1 23.7	1 13 49.1	5.09	0.955 1023	0.991 4349	0.990 5318
Aug. 1	83 31 25.6	2 14.61	1 23.4	1 13 28.8	5.09	0.955 0943	0.989 5931	0.988 6194
5	83 40 24.0	2 14.61	1 23.1	1 13 8.4	5.11	0.955 0864	0.987 6113	0.986 5694
9	83 49 22.4	2 14.61	1 22.8	1 12 47.9	5.11	0.955 0787	0.985 4943	0.984 3863
13	83 58 20.9	2 14.62	−1 22.5	−1 12 27.5	+5.11	0.955 0712	0.983 2460	0.982 0739
17	84 7 19.4	2 14.62	1 22.3	1 12 7.0	5.14	0.955 0638	0.980 8708	0.979 6375
21	84 16 17.9	2 14.63	1 22.0	1 11 46.4	5.14	0.955 0564	0.978 3748	0.977 0835
25	84 25 16.4	2 14.64	1 21.7	1 11 25.9	5.14	0.955 0493	0.975 7647	0.974 4195
29	84 34 14.9	2 14.64	1 21.5	1 11 5.3	5.15	0.955 0424	0.973 0490	0.971 6543
Sept. 2	84 43 13.5	2 14.64	−1 21.2	−1 10 44.7	+5.16	0.955 0357	0.970 2364	0.968 7963
6	84 52 12.0	2 14.65	1 20.9	1 10 24.0	5.16	0.955 0291	0.967 3350	0.965 8536
10	85 1 10.6	2 14.65	1 20.6	1 10 3.4	5.16	0.955 0226	0.964 3532	0.962 8349
14	85 10 9.2	2 14.65	1 20.3	1 9 42.7	5.17	0.955 0163	0.961 3001	0.959 7502
18	85 19 7.8	2 14.66	1 20.0	1 9 22.0	5.19	0.955 0101	0.958 1867	0.956 6112
22	85 28 6.5	2 14.66	−1 19.8	−1 9 1.2	+5.20	0.955 0041	0.955 0255	0.953 4311
26	85 37 5.1	2 14.66	1 19.5	1 8 40.4	5.20	0.954 9982	0.951 8299	0.950 2234
30	85 46 3.8	2 14.67	1 19.2	1 8 19.6	5.20	0.954 9925	0.948 6134	0.947 0018
Oct. 4	85 55 2.5	2 14.67	1 18.9	1 7 58.8	5.21	0.954 9869	0.945 3903	0.943 7806
8	86 4 1.2	2 14.68	1 18.6	1 7 37.9	5.22	0.954 9815	0.942 1745	0.940 5739
12	86 13 0.0	2 14.68	−1 18.3	−1 7 17.0	+5.24	0.954 9763	0.938 9807	0.937 3971
16	86 21 58.7	2 14.69	1 18.0	1 6 56.0	5.24	0.954 9712	0.935 8254	0.934 2676
20	86 30 57.5	2 14.69	1 17.7	1 6 35.1	5.24	0.954 9663	0.932 7261	0.931 2034
24	86 39 56.2	2 14.69	1 17.4	1 6 14.1	5.25	0.954 9616	0.929 7018	0.928 2234
28	86 48 55.0	2 14.70	1 17.0	1 5 53.1	5.26	0.954 9570	0.926 7705	0.925 3453
Nov. 1	86 57 53.8	2 14.70	−1 16.7	−1 5 32.0	+5.26	0.954 9526	0.923 9499	0.922 5865
5	87 6 52.6	2 14.70	1 16.4	1 5 11.0	5.26	0.954 9483	0.921 2573	0.919 9644
9	87 15 51.4	2 14.70	1 16.1	1 4 49.9	5.27	0.954 9441	0.918 7100	0.917 4964
13	87 24 50.2	2 14.70	1 15.8	1 4 28.8	5.29	0.954 9401	0.916 3258	0.915 2006
17	87 33 49.0	2 14.71	1 15.5	1 4 7.6	5.30	0.954 9363	0.914 1231	0.913 0955
21	87 42 47.9	2 14.72	−1 15.2	−1 3 46.4	+5.30	0.954 9326	0.912 1197	0.911 1976
25	87 51 46.8	2 14.72	1 14.9	1 3 25.2	5.30	0.954 9291	0.910 3311	0.909 5218
29	88 0 45.6	2 14.72	1 14.5	1 3 4.0	5.31	0.954 9257	0.908 7711	0.908 0804
Dec. 3	88 9 44.5	2 14.73	1 14.2	1 2 42.7	5.31	0.954 9225	0.907 4511	0.906 8845
7	88 18 43.4	2 14.73	1 13.8	1 2 21.5	5.31	0.954 9195	0.906 3818	0.905 9441
11	88 27 42.3	2 14.73	−1 13.5	−1 2 0.2	+5.33	0.954 9166	0.905 5724	0.905 2678
15	88 36 41.2	2 14.74	1 13.1	1 1 38.8	5.35	0.954 9139	0.905 0312	0.904 8632
19	88 45 40.2	2 14.74	1 12.8	1 1 17.4	5.34	0.954 9115	0.904 7642	0.904 7344
23	88 54 39.1	2 14.74	1 12.5	1 0 56.1	5.34	0.954 9091	0.904 7737	0.904 8820
27	89 3 38.0	2 14.74	1 12.1	1 0 34.7	5.36	0.954 9068	0.905 0589	0.905 3039
31	89 12 37.0	2 14.74	−1 11.8	−1 0 13.2	+5.36	0.954 9047	0.905 6163	0.905 9958
35	89 21 35.9	2 14.74	−1 11.4	−0 59 51.8	+5.37	0.954 9027	0.906 4414	

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth— At Date.	At Interm diate Dat
	° ′ ″	″	″	° ′ ″	″			
Jan. 1	307 17 17.5	39.66	+8.9	−0 37 20.8	−0.32	1.297 6858	1.316 5412	1.317 13
9	307 22 34.8	39.65	8.9	0 37 23.4	0.32	1.297 7075	1.317 6447	1.318 06
17	307 27 52.1	39.64	8.9	0 37 26.0	0.31	1.297 7293	1.318 3846	1.318 61
25	307 33 9.3	39.64	8.9	0 37 28.5	0.31	1.297 7510	1.318 7508	1.318 79
Feb. 2	307 38 26.4	39.64	8.9	0 37 31.0	0.31	1.297 7726	1.318 7369	1.318 58
10	307 43 43.5	39.64	+8.9	−0 37 33.5	−0.31	1.297 7942	1.318 3463	1.318 01
18	307 49 0.6	39.63	8.9	0 37 36.0	0.31	1.297 8158	1.317 5877	1.317 07
26	307 54 17.6	39.63	8.9	0 37 38.5	0.31	1.297 8373	1.316 4720	1.315 78
Mar. 6	307 59 34.7	39.63	8.9	0 37 41.0	0.31	1.297 8587	1.315 0171	1.314 17
14	308 4 51.7	39.62	8.9	0 37 43.5	0.31	1.297 8801	1.313 2487	1.312 25
22	308 10 8.6	39.62	+8.9	−0 37 46.0	−0.31	1.297 9014	1.311 1941	1.310 06
30	308 15 25.6	39.61	8.9	0 37 48.4	0.31	1.297 9227	1.308 8848	1.307 646
Apr. 7	308 20 42.5	39.61	8.9	0 37 50.9	0.31	1.297 9439	1.306 3600	1.305 030
15	308 25 59.4	39.61	8.9	0 37 53.4	0.31	1.297 9651	1.303 6629	1.302 26
23	308 31 16.2	39.60	8.9	0 37 55.8	0.31	1.297 9863	1.300 8361	1.299 389
May 1	308 36 33.0	39.60	+8.8	−0 37 58.3	−0.31	1.298 0074	1.297 9287	1.296 461
9	308 41 49.8	39.59	8.8	0 38 0.8	0.31	1.298 0284	1.294 9948	1.293 534
17	308 47 6.6	39.59	8.8	0 38 3.2	0.31	1.298 0494	1.292 0862	1.290 657
25	308 52 23.3	39.59	8.8	0 38 5.6	0.30	1.298 0703	1.289 2560	1.287 888
June 2	308 57 40.0	39.58	8.8	0 38 8.1	0.30	1.298 0912	1.286 5613	1.285 282
10	309 2 56.7	39.58	+8.8	−0 38 10.5	−0.30	1.298 1121	1.284 0564	1.282 890
18	309 8 13.3	39.57	8.8	0 38 12.9	0.30	1.298 1330	1.281 7902	1.280 762
26	309 13 29.9	39.57	8.8	0 38 15.3	0.30	1.298 1537	1.279 8119	1.278 945
July 4	309 18 46.4	39.56	8.8	0 38 17.8	0.30	1.298 1744	1.278 1670	1.277 480
12	309 24 3.0	39.56	8.8	0 38 20.2	0.30	1.298 1950	1.276 8908	1.276 4001
20	309 29 19.5	39.56	+8.7	−0 38 22.6	−0.30	1.298 2156	1.276 0120	1.275 729
28	309 34 36.0	39.55	8.7	0 38 25.0	0.30	1.298 2361	1.275 5547	1.275 488
Aug. 5	309 39 52.4	39.55	8.7	0 38 27.4	0.30	1.298 2565	1.275 5308	1.275 681
13	309 45 8.8	39.54	8.7	0 38 29.7	0.30	1.298 2770	1.275 9399	1.276 305
21	309 50 25.2	39.54	8.7	0 38 32.1	0.30	1.298 2974	1.276 7765	1.277 350
29	309 55 41.5	39.54	+8.7	−0 38 34.5	−0.30	1.298 3177	1.278 0248	1.278 794
Sept. 6	310 0 57.8	39.54	8.7	0 38 36.9	0.30	1.298 3380	1.279 6549	1.280 602
14	310 6 14.1	39.53	8.7	0 38 39.2	0.29	1.298 3583	1.281 6326	1.282 7397
22	310 11 30.4	39.53	8.7	0 38 41.6	0.29	1.298 3785	1.283 9179	1.285 1607
30	310 16 46.6	39.53	8.7	0 38 43.9	0.29	1.298 3986	1.286 4611	1.287 812
Oct. 8	310 22 2.8	39.53	+8.6	−0 38 46.3	−0.29	1.298 4187	1.289 2074	1.290 6401
16	310 27 19.0	39.52	8.6	0 38 48.6	0.29	1.298 4387	1.292 1034	1.293 5899
24	310 32 35.1	39.52	8.6	0 38 50.9	0.29	1.298 4587	1.295 0917	1.296 6013
Nov. 1	310 37 51.2	39.52	8.6	0 38 53.3	0.29	1.298 4786	1.298 1115	1.299 6155
9	310 43 7.2	39.51	8.6	0 38 55.6	0.29	1.298 4985	1.301 1068	1.302 5789
17	310 48 23.3	39.51	+8.5	−0 38 57.9	−0.29	1.298 5184	1.304 0249	1.305 4379
25	310 53 39.3	39.50	8.5	0 39 0.2	0.29	1.298 5382	1.306 8114	1.308 1396
Dec. 3	310 58 55.2	39.50	8.5	0 39 2.5	0.29	1.298 5579	1.309 4172	1.310 6393
11	311 4 11.2	39.50	8.5	0 39 4.8	0.29	1.298 5776	1.311 8011	1.312 8976
19	311 9 27.1	39.49	8.4	0 39 7.1	0.29	1.298 5972	1.313 9240	1.314 8760
27	311 14 43.0	39.49	+8.4	−0 39 9.4	−0.28	1.298 6168	1.315 7500	1.316 5431
35	311 19 58.9	39.48	+8.4	−0 39 11.7	−0.28	1.298 6363	1.317 2525	1.317 8760

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 1	116 44 31.3	21.73	−23.4	−0 25 59.3	+0.65	1.476 9632	1.463 1102	1.462 8437
9	116 47 25.2	21.73	23.4	0 25 54.1	0.65	1.476 9664	1.462 6500	1.462 5300
17	116 50 19.1	21.73	23.3	0 25 48.9	0.65	1.476 9696	1.462 4844	1.462 5133
25	116 53 12.9	21.73	23.2	0 25 43.7	0.65	1.476 9728	1.462 6170	1.462 7950
Feb. 2	116 56 6.8	21.73	23.2	0 25 38.4	0.65	1.476 9759	1.463 0459	1.463 3678
10	116 59 0.6	21.73	−23.1	−0 25 33.2	+0.65	1.476 9791	1.463 7585	1.464 2157
18	117 1 54.5	21.73	23.0	0 25 28.0	0.65	1.476 9822	1.464 7369	1.465 3190
26	117 4 48.3	21.73	22.9	0 25 22.8	0.65	1.476 9854	1.465 9587	1.466 6522
Mar. 6	117 7 42.1	21.73	22.9	0 25 17.5	0.65	1.476 9886	1.467 3952	1.468 1834
14	117 10 36.0	21.73	22.8	0 25 12.3	0.65	1.476 9917	1.469 0124	1.469 8779
22	117 13 29.8	21.73	−22.7	−0 25 7.1	+0.65	1.476 9949	1.470 7756	1.471 7008
30	117 16 23.7	21.73	22.7	0 25 1.9	0.65	1.476 9981	1.472 6484	1.473 6134
Apr. 7	117 19 17.5	21.73	22.6	0 24 56.6	0.65	1.477 0014	1.474 5908	1.475 5759
15	117 22 11.4	21.73	22.5	0 24 51.4	0.65	1.477 0046	1.476 5644	1.477 5518
23	117 25 5.2	21.73	22.4	0 24 46.2	0.65	1.477 0079	1.478 5336	1.479 5052
May 1	117 27 59.0	21.73	−22.3	−0 24 41.0	+0.65	1.477 0111	1.480 4621	1.481 4001
9	117 30 52.8	21.73	22.3	0 24 35.7	0.65	1.477 0144	1.482 3152	1.483 2039
17	117 33 46.7	21.73	22.2	0 24 30.5	0.65	1.477 0177	1.484 0629	1.484 8886
25	117 36 40.5	21.73	22.1	0 24 25.3	0.65	1.477 0210	1.485 6774	1.486 4263
June 2	117 39 34.3	21.73	22.0	0 24 20.0	0.65	1.477 0243	1.487 1322	1.487 7925
10	117 42 28.1	21.73	−22.0	−0 24 14.8	+0.65	1.477 0276	1.488 4052	1.488 9682
18	117 45 22.0	21.73	21.9	0 24 9.5	0.65	1.477 0309	1.489 4792	1.489 9363
26	117 48 15.8	21.73	21.8	0 24 4.3	0.65	1.477 0342	1.490 3375	1.490 6813
July 4	117 51 9.6	21.73	21.7	0 23 59.1	0.66	1.477 0375	1.490 9667	1.491 1930
12	117 54 3.4	21.73	21.7	0 23 53.8	0.66	1.477 0409	1.491 3596	1.491 4657
20	117 56 57.3	21.73	−21.6	−0 23 48.6	+0.66	1.477 0442	1.491 5105	1.491 4937
28	117 59 51.1	21.73	21.5	0 23 43.3	0.66	1.477 0475	1.491 4152	1.491 2755
Aug. 5	118 2 44.9	21.73	21.4	0 23 38.1	0.66	1.477 0509	1.491 0753	1.490 8154
13	118 5 38.7	21.73	21.4	0 23 32.8	0.66	1.477 0542	1.490 4964	1.490 1191
21	118 8 32.5	21.73	21.3	0 23 27.6	0.66	1.477 0576	1.489 6847	1.489 1948
29	118 11 26.3	21.73	−21.2	−0 23 22.3	+0.66	1.477 0610	1.488 6510	1.488 0556
Sept. 6	118 14 20.1	21.73	21.1	0 23 17.1	0.66	1.477 0644	1.487 4111	1.486 7197
14	118 17 13.9	21.73	21.1	0 23 11.8	0.66	1.477 0677	1.485 9835	1.485 2052
22	118 20 7.8	21.73	21.0	0 23 6.6	0.66	1.477 0711	1.484 3880	1.483 5354
30	118 23 1.6	21.73	20.9	0 23 1.3	0.66	1.477 0745	1.482 6511	1.481 7388
Oct. 8	118 25 55.4	21.73	−20.8	−0 22 56.1	+0.66	1.477 0780	1.480 8021	1.479 8449
16	118 28 49.2	21.73	20.8	0 22 50.8	0.66	1.477 0814	1.478 8713	1.477 8859
24	118 31 43.0	21.73	20.7	0 22 45.6	0.66	1.477 0849	1.476 8933	1.475 8985
Nov. 1	118 34 36.8	21.73	20.6	0 22 40.3	0.66	1.477 0884	1.474 9062	1.473 9212
9	118 37 30.6	21.73	20.5	0 22 35.1	0.66	1.477 0918	1.472 9480	1.471 9914
17	118 40 24.4	21.73	−20.5	−0 22 29.8	+0.66	1.477 0953	1.471 0567	1.470 1491
25	118 43 18.2	21.73	20.4	0 22 24.6	0.66	1.477 0988	1.469 2735	1.468 4347
Dec. 3	118 46 12.0	21.73	20.3	0 22 19.3	0.66	1.477 1023	1.467 6372	1.466 8853
11	118 49 5.9	21.73	20.2	0 22 14.1	0.66	1.477 1058	1.466 1830	1.465 5345
19	118 51 59.7	21.73	20.2	0 22 8.8	0.66	1.477 1093	1.464 9440	1.464 4151
27	118 54 53.5	21.73	−20.1	−0 22 3.5	+0.66	1.477 1128	1.463 9508	1.463 5536
35	118 57 47.3	21.73	−20.0	−0 21 58.3	+0.66	1.477 1163	1.463 2254	

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 0	+0.157 9004	+0.166 5285	−173	−0.890 3449	−0.889 0144	−183	−0.386 2623	−0.385 6848	+352
1	0.175 1433	0.183 7440	182	0.887 6145	0.886 1454	187	0.385 0772	0.384 4396	349
2	0.192 3301	0.200 9008	191	0.884 6072	0.883 0000	192	0.383 7720	0.383 0744	345
3	0.209 4555	0.217 9936	200	0.881 3241	0.879 5797	197	0.382 3470	0.381 5899	342
4	0.226 5143	0.235 0170	208	0.877 7669	0.875 8858	202	0.380 8032	0.379 9868	338
5	+0.243 5011	+0.251 9659	−216	−0.873 9366	−0.871 9196	−207	−0.379 1409	−0.378 2656	+335
6	0.260 4108	0.268 8351	224	0.869 8350	0.867 6827	212	0.377 3610	0.376 4271	331
7	0.277 2382	0.285 6195	232	0.865 4631	0.863 1765	217	0.375 4640	0.374 4719	327
8	0.293 9783	0.302 3140	239	0.860 8230	0.858 4027	222	0.373 4508	0.372 4007	323
9	0.310 6261	0.318 9139	246	0.855 9160	0.853 3631	228	0.371 3219	0.370 2144	319
10	+0.327 1768	+0.335 4143	−253	−0.850 7442	−0.848 0595	−234	−0.369 0784	−0.367 9138	+314
11	0.343 6257	0.351 8104	260	0.845 3091	0.842 4933	240	0.366 7207	0.365 4993	309
12	0.359 9679	0.368 0976	267	0.839 6124	0.836 6665	247	0.364 2497	0.362 9719	304
13	0.376 1989	0.384 2712	274	0.833 6559	0.830 5808	253	0.361 6661	0.360 3323	299
14	0.392 3139	0.400 3266	280	0.827 4413	0.824 2378	260	0.358 9706	0.357 5812	294
15	+0.408 3086	+0.416 2592	−286	−0.820 9704	−0.817 6392	−267	−0.356 1641	−0.354 7193	+289
16	0.424 1778	0.432 0639	291	0.814 2446	0.810 7868	274	0.353 2470	0.351 7473	284
17	0.439 9168	0.447 7361	296	0.807 2661	0.803 6826	281	0.350 2203	0.348 6660	278
18	0.455 5210	0.463 2708	301	0.800 0365	0.796 3282	289	0.347 0845	0.345 4760	272
19	0.470 9851	0.478 6633	306	0.792 5579	0.788 7258	296	0.343 8405	0.342 1783	265
20	+0.486 3046	+0.493 9083	−310	−0.784 8322	−0.780 8774	−304	−0.340 4894	−0.338 7739	+258
21	0.501 4739	0.509 0009	314	0.776 8616	0.772 7852	312	0.337 0319	0.335 2635	251
22	0.516 4885	0.523 9361	318	0.768 6484	0.764 4516	320	0.333 4688	0.331 6481	244
23	0.531 3431	0.538 7091	322	0.760 1953	0.755 8797	328	0.329 8015	0.327 9292	237
24	0.546 0332	0.553 3147	325	0.751 5051	0.747 0718	336	0.326 0312	0.324 1078	230
25	+0.560 5532	+0.567 7481	−328	−0.742 5802	−0.738 0308	−344	−0.322 1590	−0.320 1851	+223
26	0.574 8989	0.582 0048	331	0.733 4239	0.728 7599	352	0.318 1863	0.316 1627	215
27	0.589 0654	0.596 0800	333	0.724 0391	0.719 2620	360	0.314 1144	0.312 0416	208
28	0.603 0482	0.609 9693	335	0.714 4291	0.709 5407	369	0.309 9446	0.307 8235	200
29	0.616 8429	0.623 6683	337	0.704 5972	0.699 5991	377	0.305 6785	0.303 5099	192
30	+0.630 4451	+0.637 1728	−338	−0.694 5469	−0.689 4410	−385	−0.301 3178	−0.299 1024	+184
31	0.643 8509	0.650 4789	339	0.684 2819	0.679 0698	393	0.296 8639	0.294 6024	176
Feb. 1	0.657 0562	0.663 5822	339	0.673 8052	0.668 4886	402	0.292 3182	0.290 0114	167
2	0.670 0566	0.676 4789	339	0.663 1205	0.657 7012	410	0.287 6823	0.285 3311	159
3	0.682 8486	0.689 1654	339	0.652 2314	0.646 7115	419	0.282 9580	0.280 5632	151
4	+0.695 4288	+0.701 6384	−339	−0.641 1419	−0.635 5231	−428	−0.278 1469	−0.275 7092	+142
5	0.707 7936	0.713 8940	338	0.629 8557	0.624 1400	437	0.273 2504	0.270 7707	133
6	0.719 9391	0.725 9286	337	0.618 3764	0.612 5655	446	0.268 2703	0.265 7494	124
7	0.731 8622	0.737 7395	335	0.606 7077	0.600 8035	454	0.263 2082	0.260 6470	115
8	0.743 5601	0.749 3235	333	0.594 8534	0.588 8578	463	0.258 0659	0.255 4650	106
9	+0.755 0293	+0.760 6772	−331	−0.582 8172	−0.576 7321	−471	−0.252 8447	−0.250 2051	+ 97
10	0.766 2668	0.771 7978	329	0.570 6029	0.564 4300	479	0.247 5464	0.244 8688	88
11	0.777 2698	0.782 6825	326	0.558 2140	0.551 9552	487	0.242 1724	0.239 4575	78
12	0.788 0355	0.793 3283	322	0.545 6542	0.539 3113	495	0.236 7243	0.233 9729	69
13	0.798 5605	0.803 7318	319	0.532 9271	0.526 5020	503	0.231 2035	0.228 4164	59
14	+0.808 8419	+0.813 8903	−315	−0.520 0363	−0.513 5305	−511	−0.225 6117	−0.222 7895	+ 50
15	+0.818 8766	+0.823 8006	−311	−0.506 9851	−0.500 4006	−519	−0.219 9501	−0.217 0938	+ 40

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 15	+0.818 8766	+0.823 8006	−311	−0.506 9851	−0.500 4006	−519	−0.219 9501	−0.217 0938	+ 40
16	0.828 6617	0.833 4595	306	0.493 7775	0.487 1162	527	0.214 2207	0.211 3310	30
17	0.838 1937	0.842 8639	301	0.480 4173	0.473 6813	534	0.208 4250	0.205 5028	20
18	0.847 4696	0.852 0106	296	0.466 9087	0.460 0999	542	0.202 5646	0.199 6107	+ 10
19	0.856 4865	0.860 8968	291	0.453 2556	0.446 3763	549	0.196 6413	0.193 6567	0
20	+0.865 2412	+0.869 5194	−285	−0.439 4624	−0.432 5145	−556	−0.190 6571	−0.187 6428	− 10
21	0.873 7311	0.877 8759	279	0.425 5332	0.418 5191	563	0.184 6140	0.181 5708	21
22	0.881 9534	0.885 9631	273	0.411 4727	0.404 3947	570	0.178 5136	0.175 4426	31
23	0.889 9050	0.893 7788	266	0.397 2855	0.390 1457	577	0.172 3580	0.169 2601	41
24	0.897 5842	0.901 3208	260	0.382 9759	0.375 7768	584	0.166 1493	0.163 0258	51
25	+0.904 9883	+0.908 5863	−253	−0.368 5489	−0.361 2928	−590	−0.159 8898	−0.156 7415	− 62
26	0.912 1147	0.915 5734	245	0.354 0091	0.346 6984	596	0.153 5812	0.150 4092	72
27	0.918 9621	0.922 2804	237	0.339 3612	0.331 9982	602	0.147 2258	0.144 0312	82
28	0.925 5282	0.928 7052	229	0.324 6101	0.317 1974	608	0.140 8256	0.137 6094	92
Mar. 1	0.931 8112	0.934 8463	220	0.309 7608	0.302 3008	614	0.134 3829	0.131 1462	103
2	+0.937 8100	+0.940 7020	−211	−0.294 8180	−0.287 3129	−620	−0.127 8996	−0.124 6435	−113
3	0.943 5223	0.946 2710	202	0.279 7863	0.272 2388	625	0.121 3781	0.118 1036	123
4	0.948 9478	0.951 5524	193	0.264 6709	0.257 0832	631	0.114 8202	0.111 5284	133
5	0.954 0847	0.956 5445	183	0.249 4764	0.241 8510	636	0.108 2283	0.104 9202	143
6	0.958 9319	0.961 2468	173	0.234 2076	0.226 5469	641	0.101 6043	0.098 2810	154
7	+0.963 4890	+0.965 6583	−163	−0.218 8695	−0.211 1758	−646	−0.094 9504	−0.091 6128	−164
8	0.967 7547	0.969 7783	153	0.203 4665	0.195 7422	650	0.088 2684	0.084 9176	174
9	0.971 7288	0.973 6062	142	0.188 0035	0.180 2508	654	0.081 5606	0.078 1975	184
10	0.975 4104	0.977 1414	132	0.172 4848	0.164 7060	658	0.074 8287	0.071 4543	194
11	0.978 7991	0.980 3835	121	0.156 9149	0.149 1122	662	0.068 0746	0.064 6899	204
12	+0.981 8944	+0.983 3318	−110	−0.141 2983	−0.133 4738	−666	−0.061 3003	−0.057 9060	−214
13	0.984 6956	0.985 9857	98	0.125 6392	0.117 7950	670	0.054 5074	0.051 1046	224
14	0.987 2020	0.988 3445	87	0.109 9418	0.102 0803	674	0.047 6979	0.044 2875	234
15	0.989 4130	0.990 4074	75	0.094 2109	0.086 3340	677	0.040 8737	0.037 4566	244
16	0.991 3278	0.992 1741	63	0.078 4503	0.070 5605	680	0.034 0365	0.030 6138	254
17	+0.992 9461	+0.993 6437	− 50	−0.062 6651	−0.054 7646	−683	−0.027 1887	−0.023 7612	−263
18	0.994 2668	0.994 8154	38	0.046 8596	0.038 9508	686	0.020 3316	0.016 9004	273
19	0.995 2895	0.995 6891	25	0.031 0387	0.023 1239	689	0.013 4678	0.010 0339	282
20	0.996 0141	0.996 2643	− 12	−0.015 2070	−0.007 2887	691	−0.006 5991	−0.003 1636	292
21	0.996 4398	0.996 5406	+ 1	+0.000 6305	+0.008 5500	693	+0.000 2722	+0.003 7082	301
22	+0.996 5666	+0.996 5179	+ 14	+0.016 4692	+0.024 3874	−695	+0.007 1441	+0.010 5797	−310
23	0.996 3945	0.996 1964	28	0.032 3040	0.040 2182	697	0.014 0146	0.017 4484	319
24	0.995 9237	0.995 5764	41	0.048 1296	0.056 0376	698	0.020 8810	0.024 3121	328
25	0.995 1545	0.994 6580	55	0.063 9415	0.071 8407	699	0.027 7414	0.031 1688	337
26	0.994 0871	0.993 4418	69	0.079 7346	0.087 6225	700	0.034 5938	0.038 0162	346
27	+0.992 7222	+0.991 9284	+ 83	+0.095 5039	+0.103 3780	−701	+0.041 4357	+0.044 8521	−355
28	0.991 0604	0.990 1185	97	0.111 2444	0.119 1024	701	0.048 2651	0.051 6745	364
29	0.989 1027	0.988 0132	111	0.126 9514	0.134 7908	701	0.055 0799	0.058 4811	372
30	0.986 8500	0.985 6133	125	0.142 6200	0.150 4383	701	0.061 8778	0.065 2697	381
31	0.984 3034	0.982 9204	140	0.158 2451	0.166 0399	701	0.068 6566	0.072 0384	389
Apr. 1	+0.981 4644	+0.979 9355	+155	+0.173 8221	+0.181 5911	−701	+0.075 4147	+0.078 7852	−398
2	+0.978 3340	+0.976 6602	+170	+0.189 3463	+0.197 0872	−701	+0.082 1496	+0.085 5078	−406

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Redu to Mea Eq'x Jan.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noo*
Apr. 1	+0.981 4644	+0.979 9355	+155	+0.173 8221	+0.181 5911	−701	+0.075 4147	+0.078 7852	−39
2	0.978 3340	0.976 6602	170	0.189 3463	0.197 0872	701	0.082 1496	0.085 5078	40
3	0.974 9141	0.973 0958	185	0.204 8131	0.212 5236	701	0.088 8594	0.092 2042	41
4	0.971 2056	0.969 2439	200	0.220 2180	0.227 8957	700	0.095 5421	0.098 8728	42
5	0.967 2109	0.965 1068	215	0.235 5563	0.243 1992	699	0.102 1960	0.105 5114	43
6	+0.962 9318	+0.960 6861	+231	+0.250 8238	+0.258 4297	−697	+0.108 8189	+0.112 1182	−43
7	0.958 3699	0.955 9834	246	0.266 0163	0.273 5831	696	0.115 4092	0.118 6916	44
8	0.953 5269	0.951 0007	262	0.281 1296	0.288 6554	694	0.121 9652	0.125 2298	45
9	0.948 4050	0.945 7400	278	0.296 1599	0.303 6426	692	0.128 4852	0.131 7311	45
10	0.943 0060	0.940 2030	294	0.311 1031	0.318 5409	690	0.134 9674	0.138 1939	46
11	+0.937 3314	+0.934 3913	+310	+0.325 9554	+0.333 3462	−688	+0.141 4103	+0.144 6165	−47
12	0.931 3829	0.928 3065	326	0.340 7128	0.348 0547	686	0.147 8122	0.150 9971	47
13	0.925 1622	0.921 9503	342	0.355 3714	0.362 6624	683	0.154 1712	0.157 3343	48
14	0.918 6710	0.915 3244	359	0.369 9272	0.377 1653	680	0.160 4860	0.163 6261	49
15	0.911 9109	0.908 4307	375	0.384 3762	0.391 5593	677	0.166 7545	0.169 8709	49
16	+0.904 8839	+0.901 2708	+392	+0.398 7141	+0.405 8401	−674	+0.172 9751	+0.176 0668	−501
17	0.897 5916	0.893 8466	408	0.412 9367	0.420 0035	670	0.179 1458	0.182 2118	507
18	0.890 0361	0.886 1604	425	0.427 0400	0.434 0456	666	0.185 2647	0.188 3042	512
19	0.882 2198	0.878 2146	442	0.441 0197	0.447 9618	662	0.191 3301	0.194 3422	517
20	0.874 1450	0.870 0113	459	0.454 8715	0.461 7482	658	0.197 3402	0.200 3238	522
21	+0.865 8138	+0.861 5528	+476	+0.468 5913	+0.475 4002	−653	+0.203 2929	+0.206 2472	−527
22	0.857 2288	0.852 8421	494	0.482 1746	0.488 9140	648	0.209 1864	0.212 1105	531
23	0.848 3930	0.843 8819	511	0.495 6179	0.502 2857	643	0.215 0191	0.217 9120	535
24	0.839 3090	0.834 6747	529	0.508 9168	0.515 5108	638	0.220 7891	0.223 6501	539
25	0.829 9795	0.825 2238	546	0.522 0672	0.528 5855	633	0.226 4947	0.229 3227	543
26	+0.820 4079	+0.815 5323	+564	+0.535 0653	+0.541 5061	−627	+0.232 1340	+0.234 9283	−547
27	0.810 5973	0.805 6034	581	0.547 9073	0.554 2685	621	0.237 7055	0.240 4652	551
28	0.800 5509	0.795 4403	599	0.560 5893	0.566 8692	615	0.243 2073	0.245 9317	554
29	0.790 2720	0.785 0464	616	0.573 1077	0.579 3044	609	0.248 6382	0.251 3264	557
30	0.779 7641	0.774 4254	634	0.585 4588	0.591 5705	602	0.253 9963	0.256 6476	559
May 1	+0.769 0309	+0.763 5809	+651	+0.597 6390	+0.603 6640	−595	+0.259 2801	+0.261 8936	−561
2	0.758 0759	0.752 5163	669	0.609 6450	0.615 5818	588	0.264 4880	0.267 0632	563
3	0.746 9027	0.741 2356	687	0.621 4739	0.627 3208	580	0.269 6191	0.272 1553	565
4	0.735 5154	0.729 7425	705	0.633 1223	0.638 8779	572	0.274 6718	0.277 1684	567
5	0.723 9174	0.718 0406	723	0.644 5872	0.650 2500	564	0.279 6449	0.282 1012	569
6	+0.712 1125	+0.706 1336	+741	+0.655 8659	+0.661 4346	−556	+0.284 5372	+0.286 9527	−570
7	0.700 1043	0.694 0251	759	0.666 9557	0.672 4289	548	0.289 3476	0.291 7217	571
8	0.687 8963	0.681 7184	777	0.677 8539	0.683 2302	539	0.294 0749	0.296 4070	572
9	0.675 4919	0.669 2173	795	0.688 5577	0.693 8360	530	0.298 7179	0.301 0077	573
10	0.662 8950	0.656 5253	813	0.699 0648	0.704 2437	521	0.303 2761	0.305 5228	573
11	+0.650 1086	+0.643 6454	+831	+0.709 3725	+0.714 4508	−512	+0.307 7477	+0.309 9508	−573
12	0.637 1362	0.630 5813	849	0.719 4782	0.724 4543	502	0.312 1318	0.314 2907	573
13	0.623 9811	0.617 3361	867	0.729 3789	0.734 2517	492	0.316 4272	0.318 5413	573
14	0.610 6468	0.603 9136	885	0.739 0723	0.743 8402	482	0.320 6328	0.322 7014	573
15	0.597 1369	0.590 3172	903	0.748 5551	0.753 2168	472	0.324 7471	0.326 7698	572
16	+0.583 4549	+0.576 5507	+920	+0.757 8249	+0.762 3789	−461	+0.328 7692	+0.330 7451	−571
17	+0.569 6049	+0.562 6180	+938	+0.766 8785	+0.771 3236	−450	+0.332 6974	+0.334 6261	−570

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 17	+0.569 6049	+0.562 6180	+ 938	+0.766 8785	+0.771 3236	−450	+0.332 6974	+0.334 6261	−570
18	0.555 5906	0.548 5232	955	0.775 7138	0.780 0486	439	0.336 5309	0.338 4118	569
19	0.541 4163	0.534 2703	973	0.784 3277	0.788 5509	427	0.340 2685	0.342 1010	567
20	0.527 0858	0.519 8633	990	0.792 7178	0.796 8282	415	0.343 9090	0.345 6925	565
21	0.512 6034	0.505 3066	1008	0.800 8816	0.804 8778	403	0.347 4512	0.349 1850	563
22	+0.497 9735	+0.490 6045	+1025	+0.808 8165	+0.812 6973	−390	+0.350 8938	+0.352 5776	−561
23	0.483 2003	0.475 7614	1042	0.816 5200	0.820 2844	377	0.354 2362	0.355 8694	558
24	0.468 2884	0.460 7818	1059	0.823 9901	0.827 6370	363	0.357 4772	0.359 0593	555
25	0.453 2422	0.445 6702	1076	0.831 2246	0.834 7527	349	0.360 6157	0.362 1463	552
26	0.438 0663	0.430 4312	1093	0.838 2211	0.841 6296	335	0.363 6509	0.365 1294	548
27	+0.422 7656	+0.415 0700	+1110	+0.844 9779	+0.848 2658	−321	+0.366 5818	+0.368 0081	−544
28	0.407 3450	0.399 5911	1126	0.851 4931	0.854 6596	306	0.369 4080	0.370 7814	540
29	0.391 8090	0.383 9994	1143	0.857 7651	0.860 8093	291	0.372 1283	0.373 4486	535
30	0.376 1627	0.368 2994	1159	0.863 7920	0.866 7130	276	0.374 7423	0.376 0092	530
31	0.360 4103	0.352 4960	1175	0.869 5723	0.872 3698	260	0.377 2493	0.378 4625	525
June 1	+0.344 5571	+0.336 5942	+1191	+0.875 1053	+0.877 7787	−244	+0.379 6488	+0.380 8082	−520
2	0.328 6078	0.320 5986	1207	0.880 3897	0.882 9382	228	0.381 9405	0.383 0457	515
3	0.312 5672	0.304 5140	1222	0.885 4241	0.887 8473	211	0.384 1237	0.385 1747	509
4	0.296 4397	0.288 3449	1237	0.890 2077	0.892 5053	194	0.386 1985	0.387 1950	503
5	0.280 2300	0.272 0956	1252	0.894 7398	0.896 9111	177	0.388 1641	0.389 1059	497
6	+0.263 9423	+0.255 7706	+1267	+0.899 0191	+0.901 0638	−160	+0.390 0203	+0.390 9072	−491
7	0.247 5811	0.239 3743	1282	0.903 0452	0.904 9631	142	0.391 7667	0.392 5987	485
8	0.231 1506	0.222 9105	1296	0.906 8175	0.908 6081	124	0.393 4031	0.394 1800	478
9	0.214 6547	0.206 3837	1310	0.910 3348	0.911 9974	105	0.394 9292	0.395 6506	471
10	0.198 0981	0.189 7983	1324	0.913 5959	0.915 1303	87	0.396 3442	0.397 0100	464
11	+0.181 4850	+0.173 1586	+1337	+0.916 6005	+0.918 0062	− 68	+0.397 6480	+0.398 2581	−457
12	0.164 8197	0.156 4689	1350	0.919 3473	0.920 6236	48	0.398 8402	0.399 3942	450
13	0.148 1067	0.139 7337	1363	0.921 8351	0.922 9818	28	0.399 9201	0.400 4179	442
14	0.131 3504	0.122 9576	1376	0.924 0635	0.925 0801	− 8	0.400 8876	0.401 3290	434
15	0.114 5557	0.106 1454	1388	0.926 0315	0.926 9176	+ 12	0.401 7420	0.402 1267	426
16	+0.097 7272	+0.089 3017	+1400	+0.927 7383	+0.928 4935	+ 33	+0.402 4830	+0.402 8109	−417
17	0.080 8696	0.072 4314	1411	0.929 1831	0.929 8071	54	0.403 1103	0.403 3812	408
18	0.063 9877	0.055 5393	1422	0.930 3655	0.930 8582	75	0.403 6237	0.403 8376	399
19	0.047 0866	0.038 6302	1433	0.931 2850	0.931 6459	96	0.404 0229	0.404 1796	390
20	0.030 1709	0.021 7093	1444	0.931 9409	0.932 1700	118	0.404 3077	0.404 4072	381
21	+0.013 2460	+0.004 7816	+1454	+0.932 3332	+0.932 4304	+140	+0.404 4780	+0.404 5201	−371
22	−0.003 6834	−0.012 1483	1464	0.932 4615	0.932 4266	162	0.404 5335	0.404 5182	361
23	0.020 6124	0.029 0750	1473	0.932 3257	0.932 1586	184	0.404 4743	0.404 4017	351
24	0.037 5355	0.045 9933	1482	0.931 9255	0.931 6265	207	0.404 3004	0.404 1705	341
25	0.054 4477	0.062 8980	1491	0.931 2616	0.930 8307	230	0.404 0119	0.403 8246	330
26	−0.071 3437	−0.079 7841	+1499	+0.930 3339	+0.929 7714	+253	+0.403 6088	+0.403 3644	−319
27	0.088 2186	0.096 6465	1506	0.929 1431	0.928 4492	276	0.403 0915	0.402 7901	308
28	0.105 0673	0.113 4802	1513	0.927 6897	0.926 8647	300	0.402 4602	0.402 1019	297
29	0.121 8848	0.130 2804	1519	0.925 9743	0.925 0187	324	0.401 7153	0.401 3004	286
30	0.138 6663	0.147 0420	1525	0.923 9980	0.922 9122	348	0.400 8573	0.400 3859	275
July 1	−0.155 4070	−0.163 7606	+1530	+0.921 7615	+0.920 5460	+372	+0.399 8864	+0.399 3588	−264
2	−0.172 1023	−0.180 4315	+1535	+0.919 2659	+0.917 9213	+396	+0.398 8032	+0.398 2197	−252

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July 1	−0.155 4070	−0.163 7606	+1530	+0.921 7615	+0.920 5460	+ 372	+0.399 8864	+0.399 3588	−264
2	0.172 1023	0.180 4315	1535	0.919 2659	0.917 9213	396	0.398 8032	0.398 2197	252
3	0.188 7476	0.197 0502	1539	0.916 5123	0.915 0392	421	0.397 6084	0.396 9692	240
4	0.205 3387	0.213 6125	1543	0.913 5020	0.911 9007	446	0.396 3022	0.395 6075	228
5	0.221 8710	0.230 1138	1547	0.910 2355	0.908 5066	471	0.394 8851	0.394 1352	216
6	−0.238 3404	−0.246 5502	+1550	+0.906 7142	+0.904 8584	+ 496	+0.393 3577	+0.392 5527	−204
7	0.254 7427	0.262 9173	1553	0.902 9392	0.900 9569	521	0.391 7203	0.390 8605	192
8	0.271 0735	0.279 2109	1555	0.898 9115	0.896 8032	546	0.389 9734	0.389 0590	180
9	0.287 3289	0.295 4269	1557	0.894 6320	0.892 3980	572	0.388 1174	0.387 1486	167
10	0.303 5044	0.311 5608	1558	0.890 1014	0.887 7424	597	0.386 1526	0.385 1296	154
11	−0.319 5956	−0.327 6082	+1558	+0.885 3212	+0.882 8377	+ 623	+0.384 0795	+0.383 0025	−141
12	0.335 5982	0.343 5650	1558	0.880 2922	0.877 6847	648	0.381 8985	0.380 7676	128
13	0.351 5079	0.359 4264	1557	0.875 0154	0.872 2844	674	0.379 6099	0.378 4254	114
14	0.367 3200	0.375 1880	1555	0.869 4920	0.866 6383	700	0.377 2143	0.375 9766	101
15	0.383 0299	0.390 8453	1553	0.863 7234	0.860 7475	726	0.374 7123	0.373 4215	87
16	−0.398 6334	−0.406 3937	+1550	+0.857 7108	+0.854 6136	+ 752	+0.372 1043	+0.370 7608	− 74
17	0.414 1256	0.421 8286	1547	0.851 4559	0.848 2380	778	0.369 3910	0.367 9950	60
18	0.429 5022	0.437 1456	1543	0.844 9600	0.841 6221	804	0.366 5730	0.365 1250	46
19	0.444 7584	0.452 3400	1538	0.838 2245	0.834 7676	830	0.363 6510	0.362 1512	32
20	0.459 8897	0.467 4070	1533	0.831 2516	0.827 6765	856	0.360 6257	0.359 0746	18
21	−0.474 8914	−0.482 3422	+1527	+0.824 0427	+0.820 3504	+ 882	+0.357 4980	+0.355 8960	− 4
22	0.489 7589	0.497 1408	1521	0.816 5999	0.812 7914	908	0.354 2687	0.352 6163	+ 10
23	0.504 4874	0.511 7982	1514	0.808 9253	0.805 0017	934	0.350 9388	0.349 2363	24
24	0.519 0726	0.526 3102	1506	0.801 0210	0.796 9836	960	0.347 5090	0.345 7571	38
25	0.533 5102	0.540 6720	1498	0.792 8897	0.788 7396	985	0.343 9807	0.342 1799	53
26	−0.547 7953	−0.554 8795	+1489	+0.784 5336	+0.780 2722	+1011	+0.340 3549	+0.338 5058	+ 67
27	0.561 9241	0.568 9285	1480	0.775 9556	0.771 5841	1036	0.336 6328	0.334 7360	82
28	0.575 8922	0.582 8148	1470	0.767 1581	0.762 6780	1062	0.332 8156	0.330 8717	96
29	0.589 6958	0.596 5348	1459	0.758 1442	0.753 5570	1087	0.328 9046	0.326 9144	111
30	0.603 3313	0.610 0847	1448	0.748 9168	0.744 2238	1112	0.324 9012	0.322 8651	125
31	−0.616 7947	−0.623 4608	+1436	+0.739 4784	+0.734 6810	+1137	+0.320 8063	+0.318 7250	+140
Aug. 1	0.630 0825	0.636 6596	1423	0.729 8320	0.724 9317	1162	0.316 6214	0.314 4956	154
2	0.643 1915	0.649 6778	1410	0.719 9805	0.714 9786	1186	0.312 3477	0.310 1778	169
3	0.656 1181	0.662 5119	1396	0.709 9265	0.704 8244	1211	0.307 9862	0.305 7730	184
4	0.668 8589	0.675 1586	1382	0.699 6728	0.694 4719	1235	0.303 5383	0.301 2823	199
5	−0.681 4107	−0.687 6148	+1367	+0.689 2221	+0.683 9238	+1259	+0.299 0051	+0.296 7069	+213
6	0.693 7704	0.699 8770	1351	0.678 5772	0.673 1827	1283	0.294 3878	0.292 0479	228
7	0.705 9343	0.711 9418	1335	0.667 7407	0.662 2515	1306	0.289 6873	0.287 3063	243
8	0.717 8992	0.723 8060	1318	0.656 7155	0.651 1329	1329	0.284 9049	0.282 4833	258
9	0.729 6618	0.735 4661	1301	0.645 5041	0.639 8294	1352	0.280 0417	0.277 5802	273
10	−0.741 2186	−0.746 9188	+1283	+0.634 1093	+0.628 3441	+1374	+0.275 0990	+0.272 5982	+288
11	0.752 5662	0.758 1604	1264	0.622 5341	0.616 6798	1396	0.270 0779	0.267 5384	303
12	0.763 7010	0.769 1875	1245	0.610 7815	0.604 8396	1418	0.264 9797	0.262 4020	318
13	0.774 6196	0.779 9970	1225	0.598 8544	0.592 8263	1440	0.259 8056	0.257 1906	333
14	0.785 3192	0.790 5855	1205	0.586 7558	0.580 6433	1461	0.254 5571	0.251 9054	348
15	−0.795 7956	−0.800 9492	+1184	+0.574 4891	+0.568 2938	+1482	+0.249 2355	+0.246 5477	+363
16	−0.806 0459	−0.811 0852	+1163	+0.562 0576	+0.555 7819	+1503	+0.243 8421	+0.241 1190	+378

FOR GREENWICH MEAN NOON AND MIDNIGHT.

	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
te.	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
g. 16	−0.806 0459	−0.811 0852	+1163	+0.562 0576	+0.555 7810	+1503	+0.243 8421	+0.241 1190	+378
17	0.816 0666	0.820 9899	1141	0.549 4644	0.543 1081	1524	0.238 3786	0.235 6209	393
18	0.825 8545	0.830 6600	1118	0.536 7127	0.530 2789	1544	0.232 8462	0.230 0548	407
19	0.835 4060	0.840 0922	1095	0.523 8070	0.517 2972	1564	0.227 2467	0.224 4222	422
20	0.844 7182	0.849 2836	1071	0.510 7501	0.504 1663	1583	0.221 5815	0.218 7248	436
21	−0.853 7880	−0.858 2308	+1047	+0.497 5462	+0.490 8903	+1602	+0.215 8524	+0.212 9645	+450
22	0.862 6117	0.866 9306	1023	0.484 1990	0.477 4730	1620	0.210 0613	0.207 1429	464
23	0.871 1871	0.875 3807	998	0.470 7127	0.463 9187	1638	0.204 2097	0.201 2619	478
24	0.879 5112	0.883 5784	972	0.457 0916	0.450 2318	1656	0.198 2998	0.195 3235	492
25	0.887 5818	0.891 5211	946	0.443 3398	0.436 4162	1673	0.192 3333	0.189 3294	506
26	−0.895 3960	−0.899 2064	+ 919	+0.429 4616	+0.422 4764	+1690	+0.186 3120	+0.183 2814	+520
27	0.902 9520	0.906 6325	892	0.415 4611	0.408 4163	1706	0.180 2379	0.177 1816	534
28	0.910 2477	0.913 7973	864	0.401 3426	0.394 2404	1722	0.174 1127	0.171 0315	547
29	0.917 2812	0.920 6992	836	0.387 1103	0.379 9527	1737	0.167 9382	0.164 8332	561
30	0.924 0510	0.927 3363	807	0.372 7681	0.365 5572	1752	0.161 7165	0.158 5883	574
31	−0.930 5549	−0.933 7067	+ 778	+0.358 3203	+0.351 0580	+1766	+0.155 4489	+0.152 2986	+588
pt. 1	0.936 7914	0.939 8089	749	0.343 7707	0.336 4589	1779	0.149 1374	0.145 9656	601
2	0.942 7589	0.945 6412	719	0.329 1231	0.321 7640	1792	0.142 7834	0.139 5912	614
3	0.948 4557	0.951 2020	689	0.314 3820	0.306 9774	1805	0.136 3890	0.133 1770	627
4	0.953 8801	0.956 4897	658	0.299 5508	0.292 1027	1817	0.129 9554	0.126 7245	640
5	−0.959 0307	−0.961 5027	+ 627	+0.284 6336	+0.277 1440	+1829	+0.123 4844	+0.120 2354	+652
6	0.963 9056	0.966 2392	596	0.269 6344	0.262 1052	1840	0.116 9778	0.113 7117	664
7	0.968 5033	0.970 6977	564	0.254 5570	0.246 9903	1851	0.110 4374	0.107 1550	676
8	0.972 8221	0.974 8765	532	0.239 4056	0.231 8034	1862	0.103 8648	0.100 5670	688
9	0.976 8605	0.978 7739	499	0.224 1843	0.216 5488	1872	0.097 2617	0.093 9492	700
10	−0.980 6165	−0.982 3883	+ 466	+0.208 8973	+0.201 2304	+1881	+0.090 6298	+0.087 3036	+712
11	0.984 0891	0.985 7189	433	0.193 5486	0.185 8525	1890	0.083 9710	0.080 6321	724
12	0.987 2774	0.988 7641	400	0.178 1426	0.170 4194	1898	0.077 2872	0.073 9365	735
13	0.990 1789	0.991 5217	366	0.162 6835	0.154 9354	1906	0.070 5803	0.067 2188	746
14	0.992 7924	0.993 9908	332	0.147 1757	0.139 4050	1913	0.063 8522	0.060 4808	757
15	−0.995 1168	−0.996 1701	+ 298	+0.131 6238	+0.123 8327	+1920	+0.057 1048	+0.053 7244	+768
16	0.997 1507	0.998 0584	264	0.116 0323	0.108 2231	1926	0.050 3399	0.046 9516	778
17	0.998 8931	0.999 6546	229	0.100 4056	0.092 5806	1931	0.043 5598	0.040 1647	788
18	1.000 3428	1.000 9576	194	0.084 7487	0.076 9104	1936	0.036 7666	0.033 3658	798
19	1.001 4989	1.001 9666	158	0.069 0663	0.061 2172	1940	0.029 9624	0.026 5568	808
20	−1.002 3606	−1.002 6809	+ 122	+0.053 3636	+0.045 5061	+1943	+0.023 1492	+0.019 7400	+818
21	1.002 9274	1.003 1001	86	0.037 6454	0.029 7821	1946	0.016 3294	0.012 9178	827
22	1.003 1989	1.003 2240	50	0.021 9167	+0.014 0499	1948	0.009 5054	+0.006 0923	836
23	1.003 1753	1.003 0527	+ 14	+0.006 1824	−0.001 6852	1950	+0.002 6790	−0.000 7343	845
24	1.002 8563	1.002 5863	− 22	−0.009 5523	0.017 4185	1951	−0.004 1473	0.007 5599	854
25	−1.002 2426	−1.001 8251	− 59	−0.025 2830	−0.033 1452	+1952	−0.010 9718	−0.014 3827	+862
26	1.001 3340	1.000 7693	95	0.041 0046	0.048 8607	1952	0.017 7923	0.021 2003	870
27	1.000 1312	0.999 4197	132	0.056 7128	0.064 5603	1952	0.024 6066	0.028 0110	878
28	0.998 6348	0.997 7766	169	0.072 4027	0.080 2395	1951	0.031 4131	0.034 8126	885
29	0.996 8452	0.995 8406	206	0.088 0701	0.095 8939	1949	0.038 2094	0.041 6033	892
30	−0.994 7629	−0.993 6122	− 243	−0.103 7104	−0.111 5191	+1947	−0.044 9940	−0.048 3814	+899
Oct. 1	−0.992 3885	−0.991 0919	− 281	−0.119 3194	−0.127 1107	+1944	−0.051 7651	−0.055 1449	+906

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	−0.992 3885	−0.991 0919	− 281	−0.119 3194	−0.127 1107	+1944	−0.051 7651	−0.055 1449	+906
2	0.989 7226	0.988 2806	318	0.134 8925	0.142 6642	1941	0.058 5206	0.061 8919	912
3	0.986 7660	0.985 1787	356	0.150 4254	0.158 1755	1937	0.065 2586	0.068 6206	918
4	0.983 5189	0.981 7868	393	0.165 9139	0.173 6401	1933	0.071 9775	0.075 3291	924
5	0.979 9824	0.978 1058	431	0.181 3536	0.189 0538	1928	0.078 6752	0.082 0156	929
6	−0.976 1570	−0.974 1362	− 469	−0.196 7402	−0.204 4122	+1922	−0.085 3501	−0.088 6784	+934
7	0.972 0434	0.969 8788	507	0.212 0693	0.219 7109	1916	0.092 0002	0.095 3153	939
8	0.967 6424	0.965 3343	545	0.227 3364	0.234 9453	1909	0.098 6234	0.101 9244	944
9	0.962 9547	0.960 5036	584	0.242 5371	0.250 1112	1902	0.105 2180	0.108 5040	948
10	0.957 9812	0.955 3876	622	0.257 6670	0.265 2040	1894	0.111 7820	0.115 0519	952
11	−0.952 7230	−0.949 9875	− 659	−0.272 7216	−0.280 2193	+1886	−0.118 3135	−0.121 5664	+955
12	0.947 1811	0.944 3040	697	0.287 6964	0.295 1524	1877	0.124 8105	0.128 0454	959
13	0.941 3564	0.938 3384	735	0.302 5868	0.309 9989	1867	0.131 2710	0.134 4869	962
14	0.935 2501	0.932 0917	773	0.317 3881	0.324 7540	1857	0.137 6929	0.140 8888	964
15	0.928 8634	0.925 5654	810	0.332 0959	0.339 4132	1846	0.144 0742	0.147 2490	966
16	−0.922 1978	−0.918 7608	− 848	−0.346 7052	−0.353 9714	+1835	−0.150 4129	−0.153 5656	+968
17	0.915 2547	0.911 6797	886	0.361 2113	0.368 4242	1823	0.156 7068	0.159 8363	970
18	0.908 0361	0.904 3240	923	0.375 6095	0.382 7666	1811	0.162 9538	0.166 0590	971
19	0.900 5437	0.896 6955	961	0.389 8948	0.396 9936	1798	0.169 1517	0.172 2316	972
20	0.892 7797	0.888 7967	999	0.404 0625	0.411 1008	1785	0.175 2984	0.178 3519	973
21	−0.884 7467	−0.880 6300	−1036	−0.418 1079	−0.425 0834	+1771	−0.181 3919	−0.184 4181	+973
22	0.876 4470	0.872 1981	1074	0.432 0265	0.438 9367	1756	0.187 4302	0.190 4280	973
23	0.867 8835	0.863 5036	1111	0.445 8136	0.452 6566	1741	0.193 4113	0.196 3798	973
24	0.859 0588	0.854 5495	1148	0.459 4651	0.466 2387	1725	0.199 3334	0.202 2718	972
25	0.849 9760	0.845 3387	1185	0.472 9769	0.479 6791	1709	0.205 1947	0.208 1020	971
26	−0.840 6379	−0.835 8740	−1222	−0.486 3448	−0.492 9737	+1692	−0.210 9935	−0.213 8689	+969
27	0.831 0474	0.826 1584	1259	0.499 5651	0.506 1185	1675	0.216 7281	0.219 5708	967
28	0.821 2074	0.816 1948	1296	0.512 6335	0.519 1098	1657	0.222 3968	0.225 2060	965
29	0.811 1208	0.805 9859	1332	0.525 5467	0.531 9438	1638	0.227 9982	0.230 7731	963
30	0.800 7904	0.795 5348	1368	0.538 3007	0.544 6168	1619	0.233 5306	0.236 2704	960
31	−0.790 2194	−0.784 8447	−1404	−0.550 8917	−0.557 1250	+1599	−0.238 9923	−0.241 6962	+957
Nov. 1	0.779 4110	0.773 9184	1440	0.563 3162	0.569 4649	1579	0.244 3819	0.247 0491	954
2	0.768 3674	0.762 7586	1476	0.575 5706	0.581 6329	1558	0.249 6977	0.252 3275	950
3	0.757 0922	0.751 3686	1512	0.587 6512	0.593 6252	1537	0.254 9383	0.257 5299	940
4	0.745 5883	0.739 7516	1548	0.599 5545	0.605 4385	1515	0.260 1021	0.262 6547	941
5	−0.733 8589	−0.727 9105	−1583	−0.611 2768	−0.617 0689	+1493	−0.265 1875	−0.267 7003	+930
6	0.721 9069	0.715 8485	1617	0.622 8144	0.628 5129	1470	0.270 1930	0.272 6652	931
7	0.709 7357	0.703 5688	1651	0.634 1640	0.639 7672	1446	0.275 1169	0.277 5479	925
8	0.697 3483	0.691 0746	1684	0.645 3220	0.650 8281	1422	0.279 9580	0.282 3469	919
9	0.684 7481	0.678 3693	1718	0.656 2850	0.661 6922	1398	0.284 7144	0.287 0604	913
10	−0.671 9386	−0.665 4564	−1752	−0.667 0492	−0.672 3556	+1373	−0.289 3847	−0.291 6872	+906
11	0.658 9231	0.652 3391	1786	0.677 6110	0.682 8149	1347	0.293 9675	0.296 2253	890
12	0.645 7050	0.639 0211	1820	0.687 9668	0.693 0663	1321	0.298 4606	0.300 6732	891
13	0.632 2880	0.625 5062	1853	0.698 1131	0.703 1066	1294	0.302 8630	0.305 0296	883
14	0.618 6762	0.611 7985	1885	0.708 0464	0.712 9320	1267	0.307 1729	0.309 2926	875
15	−0.604 8735	−0.597 9018	−1917	−0.717 7631	−0.722 5391	+1239	−0.311 3886	−0.313 4608	+866
16	−0.590 8839	−0.583 8204	−1948	−0.727 2596	−0.731 9242	+1211	−0.315 5088	−0.317 5325	+857

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov. 16	−0.590 8839	−0.583 8204	−1948	−0.727 2596	−0.731 9242	+1211	−0.315 5088	−0.317 5325	+857
17	0.576 7118	0.569 5588	1979	0.736 5324	0.741 0839	1183	0.319 5317	0.321 5062	848
18	0.562 3619	0.555 1218	2010	0.745 5782	0.750 0151	1154	0.323 4559	0.325 3806	838
19	0.547 8390	0.540 5141	2040	0.754 3941	0.758 7148	1124	0.327 2802	0.329 1545	828
20	0.533 1477	0.525 7404	2070	0.762 9769	0.767 1801	1092	0.331 0034	0.332 8266	818
21	−0.518 2928	−0.510 8056	−2100	−0.771 3240	−0.775 4082	+1061	−0.334 6240	−0.336 3955	+807
22	0.503 2793	0.495 7146	2129	0.779 4325	0.783 3967	1029	0.338 1410	0.339 8604	796
23	0.488 1121	0.480 4725	2158	0.787 3005	0.791 1434	997	0.341 5536	0.343 2204	785
24	0.472 7962	0.465 0838	2186	0.794 9252	0.798 6456	965	0.344 8607	0.346 4743	773
25	0.457 3360	0.449 5534	2214	0.802 3044	0.805 9014	932	0.348 0612	0.349 6213	761
26	−0.441 7366	−0.433 8861	−2241	−0.809 4363	−0.812 9089	+ 898	−0.351 1545	−0.352 6606	+749
27	0.426 0026	0.418 0866	2268	0.816 3189	0.819 6659	864	0.354 1396	0.355 5913	736
28	0.410 1387	0.402 1596	2294	0.822 9498	0.826 1704	830	0.357 0157	0.358 4126	723
29	0.394 1499	0.386 1100	2320	0.829 3275	0.832 4208	795	0.359 7820	0.361 1237	710
30	0.378 0406	0.369 9423	2345	0.835 4500	0.838 4149	759	0.362 4377	0.363 7238	697
Dec. 1	−0.361 8156	−0.353 6612	−2370	−0.841 3153	−0.844 1510	+ 723	−0.364 9820	−0.366 2122	+683
2	0.345 4797	0.337 2717	2394	0.846 9219	0.849 6277	687	0.367 4142	0.368 5881	668
3	0.329 0378	0.320 7785	2418	0.852 2682	0.854 8430	650	0.369 7336	0.370 8507	654
4	0.312 4944	0.304 1861	2441	0.857 3520	0.859 7952	613	0.371 9393	0.372 9993	639
5	0.295 8542	0.287 4993	2463	0.862 1722	0.864 4827	575	0.374 0307	0.375 0333	624
6	−0.279 1221	−0.270 7232	−2485	−0.866 7267	−0.868 9040	+ 537	−0.376 0071	−0.376 9519	+609
7	0.262 3030	0.253 8623	2506	0.871 0144	0.873 0576	498	0.377 8677	0.378 7544	593
8	0.245 4017	0.236 9217	2527	0.875 0335	0.876 9418	459	0.379 6119	0.380 4400	576
9	0.228 4230	0.219 9063	2547	0.878 7824	0.880 5551	419	0.381 2388	0.382 0082	559
10	0.211 3721	0.202 8211	2566	0.882 2597	0.883 8961	379	0.382 7480	0.383 4582	542
11	−0.194 2539	−0.185 6712	−2584	−0.885 4640	−0.886 9631	+ 338	−0.384 1386	−0.384 7892	+525
12	0.177 0737	0.168 4621	2602	0.888 3934	0.889 7548	297	0.385 4099	0.386 0006	508
13	0.159 8370	0.151 1990	2619	0.891 0470	0.892 2698	256	0.386 5613	0.387 0919	491
14	0.142 5490	0.133 8876	2635	0.893 4231	0.894 5069	214	0.387 5923	0.388 0625	474
15	0.125 2156	0.116 5335	2650	0.895 5210	0.896 4652	172	0.388 5024	0.388 9120	456
16	−0.107 8422	−0.099 1425	−2665	−0.897 3394	−0.898 1436	+ 130	−0.389 2912	−0.389 6399	+438
17	0.090 4350	0.081 7204	2679	0.898 8776	0.899 5413	87	0.389 9581	0.390 2458	420
18	0.072 9995	0.064 2731	2692	0.900 1348	0.900 6581	44	0.390 5030	0.390 7298	402
19	0.055 5418	0.046 8064	2704	0.901 1110	0.901 4935	+ 1	0.390 9260	0.391 0916	384
20	0.038 0677	0.029 3263	2716	0.901 8056	0.902 0474	− 43	0.391 2266	0.391 3311	365
21	−0.020 5829	−0.011 8383	−2726	−0.902 2189	−0.902 3199	− 87	−0.391 4051	−0.391 4485	+346
22	−0.003 0932	+0.005 6518	2736	0.902 3505	0.902 3109	131	0.391 4615	0.391 4440	326
23	+0.014 3960	0.023 1388	2746	0.902 2011	0.902 0211	176	0.391 3960	0.391 3176	306
24	0.031 8794	0.040 6171	2755	0.901 7709	0.901 4506	221	0.391 2088	0.391 0696	286
25	0.049 3513	0.058 0813	2762	0.901 0603	0.900 5999	266	0.390 9000	0.390 7001	266
26	+0.066 8064	+0.075 5259	−2768	−0.900 0695	−0.899 4692	− 312	−0.390 4698	−0.390 2092	+245
27	0.084 2393	0.092 9459	2773	0.898 7992	0.898 0595	358	0.389 9184	0.389 5974	225
28	0.101 6450	0.110 3359	2777	0.897 2501	0.896 3711	404	0.389 2462	0.388 8648	204
29	0.119 0180	0.127 6907	2781	0.895 4226	0.894 4048	450	0.388 4533	0.388 0118	183
30	0.136 3533	0.145 0052	2785	0.893 3177	0.892 1613	496	0.387 5403	0.387 0387	162
31	+0.153 6458	+0.162 2744	−2787	−0.890 9358	−0.889 6413	− 542	−0.386 5072	−0.385 9458	+141
32	+0.170 8904	+0.179 4931	−2788	−0.888 2779	−0.886 8457	− 588	−0.385 3545	−0.384 7334	+119

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Long.	Latitude.		True Long.	Latitude.		True Long.	Latitude
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′
1.0	337 14 8.6	−0 52 39.5	1.0	20 40 15.2	+3 1 41.2	1.0	28 57 5.7	+3 41 14
1.5	343 13 33.5	−0 20 57.0	1.5	26 34 59.1	3 27 3.1	1.5	34 52 13.7	4 3 34
2.0	349 10 35.0	+0 10 48.4	2.0	32 31 11.8	3 50 18.2	2.0	40 48 43.2	4 23 22
2.5	355 5 50.4	0 42 18.8	2.5	38 29 32.0	4 11 11.6	2.5	46 47 4.9	4 40 25
3.0	0 59 59.3	1 13 17.1	3.0	44 30 38.2	4 29 29.0	3.0	52 47 51.0	4 54 31
3.5	6 53 42.6	+1 43 26.7	3.5	50 35 8.3	+4 44 55.8	3.5	58 51 34.4	+5 5 27
4.0	12 47 41.9	2 12 31.4	4.0	56 43 38.9	4 57 17.6	4.0	64 58 48.6	5 13 3
4.5	18 42 39.0	2 40 15.3	4.5	62 56 44.6	5 6 20.2	4.5	71 10 7.2	5 17 6
5.0	24 39 15.2	3 6 22.4	5.0	69 14 56.9	5 11 49.8	5.0	77 26 2.9	5 17 29
5.5	30 38 10.5	3 30 36.6	5.5	75 38 43.4	5 13 33.4	5.5	83 47 7.0	5 14 0
6.0	36 40 3.6	+3 52 41.6	6.0	82 8 26.6	+5 11 19.1	6.0	90 13 48.6	+5 6 34
6.5	42 45 29.8	4 12 20.7	6.5	88 44 23.0	5 4 57.3	6.5	96 46 33.2	4 55 3
7.0	48 55 1.9	4 29 17.2	7.0	95 26 42.2	4 54 20.8	7.0	103 25 41.8	4 39 25
7.5	55 9 8.1	4 43 14.4	7.5	102 15 25.8	4 39 25.9	7.5	110 11 30.1	4 19 41
8.0	61 28 11.7	4 53 55.7	8.0	109 10 26.7	4 20 13.8	8.0	117 4 6.5	3 55 54
8.5	67 52 30.5	+5 1 5.5	8.5	116 11 28.9	+3 56 50.8	8.5	124 3 31.2	+3 28 14
9.0	74 22 15.7	5 4 29.3	9.0	123 18 7.2	3 29 29.5	9.0	131 9 35.6	2 56 56
9.5	80 57 31.5	5 3 54.6	9.5	130 29 48.1	2 58 29.0	9.5	138 22 0.9	2 22 22
10.0	87 38 14.7	4 59 11.7	10.0	137 45 50.0	2 24 15.3	10.0	145 40 17.8	1 45 2
10.5	94 24 14.8	4 50 14.3	10.5	145 5 24.9	1 47 20.8	10.5	153 3 46.7	1 5 29.
11.0	101 15 14.0	+4 37 0.7	11.0	152 27 40.0	+1 8 23.5	11.0	160 31 38.6	+0 24 27.
11.5	108 10 47.6	4 19 33.9	11.5	159 51 39.5	+0 28 6.0	11.5	168 2 55.1	−0 17 19.
12.0	115 10 25.4	3 58 2.6	12.0	167 16 26.9	−0 12 46.0	12.0	175 36 31.6	0 59 0.
12.5	122 13 32.6	3 32 41.4	12.5	174 41 6.4	0 53 25.6	12.5	183 11 18.7	1 39 44.
13.0	129 19 30.9	3 3 50.5	13.0	182 4 45.3	1 33 7.0	13.0	190 46 4.8	2 18 41.
13.5	136 27 40.8	+2 31 55.5	13.5	189 26 35.9	−2 11 6.4	13.5	198 19 38.9	−2 55 5
14.0	143 37 22.7	1 57 27.0	14.0	196 45 55.7	2 46 43.6	14.0	205 50 53.7	3 28 14.
14.5	150 47 58.7	1 20 59.6	14.5	204 2 8.8	3 19 23.4	14.5	213 18 47.4	3 57 34.
15.0	157 58 53.5	0 43 10.5	15.0	211 14 46.3	3 48 36.5	15.0	220 42 26.1	4 22 38.
15.5	165 9 35.3	+0 4 38.9	15.5	218 23 25.9	4 13 59.2	15.5	228 1 4.9	4 43 7.
16.0	172 19 36.9	−0 33 55.7	16.0	225 27 51.9	−4 35 13.8	16.0	235 14 9.2	−4 58 48.
16.5	179 28 35.5	1 11 54.4	16.5	232 27 54.4	4 52 8.0	16.5	242 21 14.5	5 9 40.
17.0	186 36 12.7	1 48 39.6	17.0	239 23 28.8	5 4 35.0	17.0	249 22 6.3	5 15 42.
17.5	193 42 14.4	2 23 36.2	17.5	246 14 34.8	5 12 32.6	17.5	256 16 39.1	5 17 3.
18.0	200 46 29.4	2 56 12.1	18.0	253 1 15.5	5 16 2.7	18.0	263 4 55.5	5 13 54.
18.5	207 48 49.3	−3 25 58.5	18.5	259 43 36.7	−5 15 10.9	18.5	269 47 4.9	−5 6 30.
19.0	214 49 7.9	3 52 30.2	19.0	266 21 46.3	5 10 5.9	19.0	276 23 22.5	4 55 8.
19.5	221 47 19.8	4 15 26.1	19.5	272 55 53.4	5 0 59.2	19.5	282 54 7.6	4 40 5.
20.0	228 43 19.8	4 34 29.1	20.0	279 26 7.9	4 48 4.5	20.0	289 19 42.6	4 21 43.
20.5	235 37 2.9	4 49 26.2	20.5	285 52 40.2	4 31 37.5	20.5	295 40 32.2	4 0 20.
21.0	242 28 23.1	−5 0 8.5	21.0	292 15 40.6	−4 11 55.6	21.0	301 57 2.0	−3 36 18.
21.5	249 17 13.3	5 6 31.2	21.5	298 35 19.7	3 49 17.9	21.5	308 9 38.1	3 9 57.
22.0	256 3 25.8	5 8 33.6	22.0	304 51 47.6	3 24 4.4	22.0	314 18 46.3	2 41 38.
22.5	262 46 51.8	5 6 18.9	22.5	311 5 14.3	2 56 36.2	22.5	320 24 51.6	2 11 43.
23.0	269 27 21.8	4 59 54.0	23.0	317 15 50.0	2 27 15.0	23.0	326 28 18.2	1 40 31.
23.5	276 4 45.9	−4 49 29.5	23.5	323 23 45.0	−1 56 23.0	23.5	332 29 28.8	−1 8 25.
24.0	282 38 54.9	4 35 19.2	24.0	329 29 9.9	1 24 22.6	24.0	338 28 44.7	0 35 44.
24.5	289 9 40.5	4 17 39.6	24.5	335 32 16.1	0 51 36.1	24.5	344 26 25.8	−0 2 50.
25.0	295 36 55.5	3 56 49.7	25.0	341 33 15.7	−0 18 25.6	25.0	350 22 50.7	+0 29 57.
25.5	302 0 35.1	3 33 10.3	25.5	347 32 22.0	+0 14 47.6	25.5	356 18 16.9	1 2 19.
26.0	308 20 36.9	−3 7 3.6	26.0	353 29 49.5	+0 47 42.5	26.0	2 13 0.9	+1 33 55.
26.5	314 37 1.6	2 38 52.9	26.5	359 25 54.4	1 19 59.0	26.5	8 7 18.5	2 4 27.
27.0	320 49 53.2	2 9 1.7	27.0	5 20 54.3	1 51 18.2	27.0	14 1 25.0	2 33 36
27.5	326 59 19.4	1 37 53.3	27.5	11 15 8.9	2 21 22.0	27.5	19 55 35.5	3 1 5
28.0	333 5 31.5	1 5 50.8	28.0	17 8 59.7	2 49 53.2	28.0	25 50 5.5	3 26 37.
28.5	339 8 44.3	−0 33 16.8	28.5	23 2 50.2	+3 16 35.6	28.5	31 45 10.9	+3 49 57.
29.0	345 9 16.2	−0 0 32.5	29.0	28 57 5.7	3 41 14.1	29.0	37 41 7.9	4 10 51
29.5	351 7 29.4	+0 32 1.8	29.5	34 52 13.7	4 3 34.3	29.5	43 38 14.1	4 29 5
30.0	357 3 49.1	1 4 6.6	30.0	40 48 43.2	4 23 22.4	30.0	49 36 48.4	4 44 28
30.5	2 58 43.5	1 35 23.7	30.5	46 47 4.9	4 40 25.6	30.5	55 37 10.8	4 56 46
31.0	8 52 43.4	+2 5 36.0	31.0	52 47 51.0	+4 54 31.2	31.0	61 39 43.0	+5 5 52
31.5	14 46 22.2	+2 34 27.1	31.5	58 51 34.4	+5 5 27.5	31.5	67 44 48.2	+5 11 34

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Long.	Latitude.		True Long.	Latitude.		True Long.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	73 52 51.0	+5 13 47.4	1.0	108 39 0.0	+4 8 52.7	1.0	159 2 1.6	+0 6 35.6
1.5	80 4 17.2	5 12 22.9	1.5	115 8 32.6	3 47 10.5	1.5	165 58 55.0	−0 30 6.4
2.0	86 19 33.7	5 7 15.9	2.0	121 42 30.8	3 22 14.1	2.0	173 0 2.1	1 6 43.0
2.5	92 39 7.7	4 58 22.7	2.5	128 21 14.9	2 54 15.9	2.5	180 5 22.2	1 42 38.9
3.0	99 3 26.6	4 45 41.2	3.0	135 5 3.7	2 23 31.9	3.0	187 14 48.6	2 17 17.6
3.5	105 32 56.9	+4 29 11.3	3.5	141 54 13.8	+1 50 21.3	3.5	194 28 7.4	−2 50 1.7
4.0	112 8 3.4	4 8 55.6	4.0	148 48 58.7	1 15 7.3	4.0	201 44 56.3	3 20 14.2
4.5	118 49 8.3	3 44 59.8	4.5	155 49 26.5	0 38 17.5	4.5	209 4 43.9	3 47 19.8
5.0	125 36 30.2	3 17 33.3	5.0	162 55 39.0	+0 0 23.5	5.0	216 26 50.1	4 10 45.8
5.5	132 30 22.2	2 46 49.9	5.5	170 7 30.0	−0 37 59.2	5.5	223 50 26.6	4 30 3.4
6.0	139 30 51.0	+2 13 8.2	6.0	177 24 43.8	−1 16 11.4	6.0	231 14 38.3	−4 44 49.7
6.5	146 37 55.2	1 36 52.4	6.5	184 46 54.4	1 53 30.8	6.5	238 38 25.0	4 54 48.1
7.0	153 51 24.0	0 58 32.7	7.0	192 13 24.5	2 29 13.7	7.0	246 0 43.5	4 59 49.3
7.5	161 10 56.0	+0 18 44.8	7.5	199 43 25.6	3 2 36.3	7.5	253 20 31.2	4 59 51.6
8.0	168 35 58.5	−0 21 50.2	8.0	207 15 59.2	3 32 56.4	8.0	260 36 48.5	4 55 1.1
8.5	176 5 47.4	−1 2 26.4	8.5	214 49 57.8	−3 59 35.7	8.5	267 48 41.1	−4 45 30.6
9.0	183 39 27.4	1 42 15.4	9.0	222 24 7.9	4 22 1.1	9.0	274 55 22.3	4 31 39.0
9.5	191 15 53.3	2 20 27.5	9.5	229 57 12.4	4 39 46.8	9.5	281 56 15.1	4 13 49.7
10.0	198 53 52.2	2 56 14.2	10.0	237 27 54.7	4 52 35.1	10.0	288 50 52.6	3 52 29.7
10.5	206 32 6.3	3 28 50.4	10.5	244 55 2.1	5 0 17.1	10.5	295 38 58.4	3 28 8.0
11.0	214 9 15.4	−3 57 36.7	11.0	252 17 28.4	−5 2 52.8	11.0	302 20 26.7	−3 1 14.5
11.5	221 44 1.0	4 22 1.0	11.5	259 34 16.9	5 0 29.9	11.5	308 55 21.4	2 32 18.8
12.0	229 15 9.3	4 41 39.8	12.0	266 44 42.9	4 53 23.0	12.0	315 23 55.2	2 1 49.6
12.5	236 41 34.7	4 56 18.5	12.5	273 48 14.0	4 41 52.0	12.5	321 46 28.3	1 30 14.2
13.0	244 2 21.5	5 5 51.4	13.0	280 44 30.4	4 26 20.9	13.0	328 3 27.1	0 57 58.2
13.5	251 16 45.8	−5 10 20.9	13.5	287 33 24.6	−4 7 16.0	13.5	334 15 23.1	−0 25 24.9
14.0	258 24 16.3	5 9 56.0	14.0	294 15 0.4	3 45 5.1	14.0	340 22 51.5	+0 7 4.0
14.5	265 24 34.3	5 4 51.4	14.5	300 49 31.2	3 20 15.9	14.5	346 26 30.5	0 39 8.7
15.0	272 17 33.2	4 55 26.2	15.0	307 17 19.0	2 53 15.4	15.0	352 26 59.6	1 10 30.8
15.5	279 3 16.5	4 42 2.0	15.5	313 38 52.1	2 24 29.7	15.5	358 24 59.3	1 40 53.3
16.0	285 41 57.3	−4 25 1.9	16.0	319 54 43.8	−1 54 23.5	16.0	4 21 10.4	+2 10 0.4
16.5	292 13 56.0	4 4 50.0	16.5	326 5 31.0	1 23 20.0	16.5	10 16 12.9	2 37 37.1
17.0	298 39 39.0	3 41 50.5	17.0	332 11 52.8	0 51 40.8	17.0	16 10 45.8	3 3 28.9
17.5	304 59 36.9	3 16 27.1	17.5	338 14 29.6	−0 19 46.2	17.5	22 5 26.1	3 27 22.0
18.0	311 14 23.4	2 49 2.8	18.0	344 14 1.7	+0 12 4.6	18.0	28 0 48.6	3 49 2.8
18.5	317 24 33.9	−2 19 59.8	18.5	350 11 9.3	+0 43 33.6	18.5	33 57 25.9	+4 8 18.2
19.0	323 30 44.2	1 49 39.6	19.0	356 6 31.1	1 14 23.4	19.0	39 55 47.4	4 24 55.3
19.5	329 33 30.4	1 18 23.0	19.5	2 0 44.1	1 44 17.4	19.5	45 56 19.0	4 38 41.9
20.0	335 33 27.6	0 46 29.8	20.0	7 54 22.9	2 12 59.4	20.0	51 59 23.1	4 49 26.2
20.5	341 31 9.3	−0 14 19.6	20.5	13 47 59.8	2 40 13.4	20.5	58 5 18.3	4 56 57.5
21.0	347 27 7.1	+0 17 48.7	21.0	19 42 4.0	+3 5 44.0	21.0	64 14 19.2	+5 1 6.2
21.5	353 21 50.7	0 49 36.6	21.5	25 37 1.7	3 29 16.0	21.5	70 26 36.5	5 1 44.1
22.0	359 15 47.4	1 20 45.9	22.0	31 33 16.1	3 50 34.8	22.0	76 42 16.8	4 58 45.1
22.5	5 9 21.7	1 50 58.7	22.5	37 31 7.1	4 9 26.0	22.5	83 1 23.4	4 52 5.2
23.0	11 2 56.0	2 19 57.5	23.0	43 30 51.2	4 25 36.2	23.0	89 23 56.1	4 41 43.1
23.5	16 56 50.3	+2 47 25.1	23.5	49 32 41.8	+4 38 52.6	23.5	95 49 51.9	+4 27 40.7
24.0	22 51 22.2	3 13 5.1	24.0	55 36 49.8	4 49 3.7	24.0	102 19 5.5	4 10 2.9
24.5	28 46 47.2	3 36 41.4	24.5	61 43 23.3	4 55 59.5	24.5	108 51 30.1	3 48 58.2
25.0	34 43 19.2	3 57 58.8	25.0	67 52 28.1	4 59 31.4	25.0	115 26 58.0	3 24 38.8
25.5	40 41 10.7	4 16 43.0	25.5	74 4 8.5	4 59 32.9	25.5	122 5 21.0	2 57 20.4
26.0	46 40 32.9	+4 32 40.9	26.0	80 18 27.6	+4 55 59.6	26.0	128 46 31.3	+2 27 22.0
26.5	52 41 36.5	4 45 40.4	26.5	86 35 27.8	4 48 49.4	26.5	135 30 22.1	1 55 6.0
27.0	58 44 31.7	4 55 31.0	27.0	92 55 11.2	4 38 2.7	27.0	142 16 47.9	1 20 57.8
27.5	64 49 29.1	5 2 3.7	27.5	99 17 40.5	4 23 42.9	27.5	149 5 44.2	0 45 25.2
28.0	70 56 39.6	5 5 10.9	28.0	105 42 59.4	4 5 55.8	28.0	155 57 7.8	+0 8 58.3
28.5	77 6 15.1	+5 4 46.9	28.5	112 11 12.9	+3 44 50.0	28.5	162 50 56.9	−0 27 50.9
29.0	83 18 28.8	5 0 48.0	29.0	118 42 27.3	3 20 37.2	29.0	169 47 9.9	1 4 29.5
29.5	89 33 35.3	4 53 12.1	29.5	125 16 50.7	2 53 31.7	29.5	176 45 45.2	1 40 23.6
30.0	95 51 50.7	4 41 59.1	30.0	131 54 32.5	2 23 50.8	30.0	183 46 40.2	2 14 59.1
30.5	102 13 32.6	4 27 11.2	30.5	138 35 43.4	1 51 54.5	30.5	190 49 50.7	2 47 42.3
31.0	108 39 0.0	+4 8 52.7	31.0	145 20 34.7	+1 18 5.7	31.0	197 55 9.6	−3 18 0.4
31.5	115 8 32.6	+3 47 10.5	31.5	152 9 17.4	+0 42 49.9	31.5	205 2 26.0	−3 45 22.1

MOON'S LONGITUDE AND LATITUDE, 1914.

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Long.	Latitude.		True Long.	Latitude.		True Long.	Latitu
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′
1.0	197 55 9.6	−3 18 0.4	1.0	251 20 56.4	−5 11 44.5	1.0	302 8 6.8	−2 56
1.5	205 2 26.0	3 45 22.1	1.5	258 19 32.4	5 5 59.8	1.5	308 36 18.8	2 25
2.0	212 11 25.0	4 9 18.7	2.0	265 15 49.5	4 55 47.5	2.0	315 1 6.4	1 53
2.5	219 21 46.5	4 29 24.5	2.5	272 9 28.4	4 41 21.1	2.5	321 22 35.6	1 19
3.0	226 33 5.3	4 45 17.7	3.0	279 0 10.5	4 22 58.3	3.0	327 40 53.2	0 45
3.5	233 44 51.1	−4 56 41.3	3.5	285 47 38.7	−4 1 0.2	3.5	333 56 6.2	−0 10
4.0	240 56 29.1	5 3 23.3	4.0	292 31 36.7	3 35 50.8	4.0	340 8 22.6	+0 23
4.5	248 7 20.5	5 5 17.8	4.5	299 11 51.0	3 7 56.6	4.5	346 17 51.5	0 57
5.0	255 16 44.6	5 2 25.0	5.0	305 48 10.5	2 37 45.3	5.0	352 24 42.5	1 30
5.5	262 23 59.4	4 54 51.0	5.5	312 20 27.6	2 5 45.7	5.5	358 29 7.3	2 2
6.0	269 28 23.5	−4 42 48.0	6.0	318 48 37.8	−1 32 26.8	6.0	4 31 19.6	+2 32
6.5	276 29 18.4	4 26 33.4	6.5	325 12 40.6	0 58 16.9	6.5	10 31 34.2	3 0
7.0	283 26 8.8	4 6 29.2	7.0	331 32 39.8	−0 23 43.5	7.0	16 30 7.9	3 26
7.5	290 18 25.2	3 43 1.1	7.5	337 48 42.2	+0 10 47.2	7.5	22 27 19.5	3 50
8.0	297 5 44.2	3 16 37.1	8.0	344 0 59.7	0 44 50.9	8.0	28 23 30.0	4 11
8.5	303 47 49.5	−2 47 47.1	8.5	350 9 46.8	+1 18 5.1	8.5	34 19 2.2	+4 29
9.0	310 24 31.7	2 17 1.2	9.0	356 15 22.1	1 50 9.3	9.0	40 14 21.2	4 45
9.5	316 55 49.1	1 44 49.3	9.5	2 18 7.6	2 20 44.8	9.5	46 9 53.8	4 57
10.0	323 21 47.1	1 11 40.3	10.0	8 18 27.9	2 49 34.8	10.0	52 6 9.0	5 7
10.5	329 42 36.8	0 38 1.3	10.5	14 16 50.3	3 16 24.4	10.5	58 3 37.0	5 13
11.0	335 58 35.8	−0 4 17.9	11.0	20 13 45.0	+3 40 59.8	11.0	64 2 49.7	+5 16
11.5	342 10 7.0	+0 29 6.6	11.5	26 9 43.0	4 3 8.9	11.5	70 4 19.9	5 15
12.0	348 17 37.2	1 1 50.9	12.0	32 5 17.9	4 22 40.4	12.0	76 8 41.1	5 11
12.5	354 21 37.1	1 33 35.6	12.5	38 1 4.2	4 39 24.0	12.5	82 16 27.1	5 3
13.0	0 22 40.4	2 4 3.1	13.0	43 57 36.7	4 53 10.2	13.0	88 28 11.1	4 51
13.5	6 21 22.6	+2 32 57.5	13.5	49 55 31.2	+5 3 50.0	13.5	94 44 25.5	+4 36
14.0	12 18 20.9	3 0 4.0	14.0	55 55 22.9	5 11 14.9	14.0	101 5 40.8	4 18
14.5	18 14 13.4	3 25 9.1	14.5	61 57 46.5	5 15 17.3	14.5	107 32 24.8	3 56
15.0	24 9 38.3	3 48 0.0	15.0	68 3 15.4	5 15 49.9	15.0	114 5 1.5	3 30
15.5	30 5 13.8	4 8 24.7	15.5	74 12 21.4	5 12 46.7	15.5	120 43 50.3	3 1
16.0	36 1 37.2	+4 26 11.4	16.0	80 25 33.9	+5 6 2.4	16.0	127 29 4.6	+2 30
16.5	41 59 24.5	4 41 9.2	16.5	86 43 18.8	4 55 33.5	16.5	134 20 50.6	1 55
17.0	47 59 9.8	4 53 7.3	17.0	93 5 58.6	4 41 18.5	17.0	141 19 6.5	1 19
17.5	54 1 25.0	5 1 55.3	17.5	99 33 51.2	4 23 18.4	17.5	148 23 41.4	0 40
18.0	60 6 38.9	5 7 23.7	18.0	106 7 9.1	4 1 37.2	18.0	155 34 14.9	+0 1
18.5	66 15 17.3	+5 9 24.0	18.5	112 45 59.1	+3 36 22.9	18.5	162 50 16.3	−0 38
19.0	72 27 41.8	5 7 48.4	19.0	119 30 21.7	3 7 47.7	19.0	170 11 5.3	1 18
19.5	78 44 10.1	5 2 30.8	19.5	126 20 10.8	2 36 8.5	19.5	177 35 52.9	1 57
20.0	85 4 54.9	4 53 27.5	20.0	133 15 13.2	2 1 47.5	20.0	185 3 41.8	2 34
20.5	91 30 4.6	4 40 37.0	20.5	140 15 9.3	1 25 12.0	20.5	192 33 29.1	3 8
21.0	97 59 42.3	+4 24 0.8	21.0	147 19 33.0	+0 46 54.0	21.0	200 4 8.2	−3 39
21.5	104 33 46.1	4 3 44.2	21.5	154 27 52.5	+0 7 30.2	21.5	207 34 31.9	4 7
22.0	111 12 9.7	3 39 56.3	22.0	161 39 30.9	−0 32 19.6	22.0	215 3 34.4	4 30
22.5	117 54 42.1	3 12 50.4	22.5	168 53 48.0	1 11 53.2	22.5	222 30 13.8	4 48
23.0	124 41 8.7	2 42 44.3	23.0	176 10 0.8	1 50 27.5	23.0	229 53 35.3	5 2
23.5	131 31 11.7	+2 10 0.4	23.5	183 27 25.0	−2 27 19.9	23.5	237 12 51.8	−5 10
24.0	138 24 30.8	1 35 5.0	24.0	190 45 16.5	3 1 50.1	24.0	244 27 25.3	5 13
24.5	145 20 44.1	0 58 28.4	24.5	198 2 53.2	3 33 21.2	24.5	251 36 47.8	5 12
25.0	152 19 28.9	+0 20 43.7	25.0	205 19 35.0	4 1 20.7	25.0	258 40 40.7	5 5
25.5	159 20 22.3	−0 17 33.3	25.5	212 34 45.7	4 25 21.6	25.5	265 38 54.2	4 55
26.0	166 23 2.1	−0 55 45.6	26.0	219 47 53.2	−4 45 2.6	26.0	272 31 26.8	−4 40
26.5	173 27 6.8	1 33 15.6	26.5	226 58 30.0	5 0 8.5	26.5	279 18 23.8	4 21
27.0	180 32 16.2	2 9 26.1	27.0	234 6 13.3	5 10 30.0	27.0	285 59 55.7	3 59
27.5	187 38 11.4	2 43 41.2	27.5	241 10 45.0	5 16 3.4	27.5	292 36 18.0	3 34
28.0	194 44 35.1	3 15 27.2	28.0	248 11 51.7	5 16 50.4	28.0	299 7 48.9	3 6
28.5	201 51 10.8	−3 44 13.0	28.5	255 9 23.4	−5 12 57.4	28.5	305 34 48.6	−2 37
29.0	208 57 42.6	4 9 31.1	29.0	262 3 13.8	5 4 34.7	29.0	311 57 38.6	2 6
29.5	216 3 55.2	4 30 57.9	29.5	268 53 19.6	4 51 56.6	29.5	318 16 40.5	1 33
30.0	223 9 33.3	4 48 13.9	30.0	275 39 40.1	4 35 20.4	30.0	324 32 15.8	1 0
30.5	230 14 21.1	5 1 4.2	30.5	282 22 56.2	4 15 6.1	30.5	330 44 45.1	−0 26
31.0	237 18 2.4	−5 9 18.7	31.0	289 1 10.2	−3 51 35.6	31.0	336 54 27.5	+0 6
31.5	244 20 20.1	−5 12 52.3	31.5	295 36 25.6	−3 25 12.8	31.5	343 1 41.3	+0 40

MOON'S LONGITUDE AND LATITUDE, 1914.

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		Day of Month.	NOVEMBER.		Day of Month.	DECEMBER.	
	True Long.	Latitude.		True Long.	Latitude.		True Long.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	336 54 27.5	+0 6 48.1	1.0	22 1 25.8	+3 45 46.7	1.0	54 34 3.1	+4 57 46.5
1.5	343 1 41.3	0 40 9.9	1.5	27 57 13.0	4 5 21.5	1.5	60 33 7.1	4 59 19.5
2.0	349 6 43.1	1 12 50.0	2.0	33 52 56.5	4 22 14.6	2.0	66 33 34.3	4 57 32.8
2.5	355 9 48.3	1 44 28.1	2.5	39 48 47.9	4 36 16.0	2.5	72 35 31.9	4 52 25.4
3.0	1 11 11.1	2 14 44.7	3.0	45 44 57.7	4 47 17.0	3.0	78 39 6.6	4 43 57.6
3.5	7 11 5.0	+2 43 21.9	3.5	51 41 35.8	+4 55 10.6	3.5	84 44 24.4	+4 32 12.2
4.0	13 9 42.6	3 10 2.9	4.0	57 38 52.5	4 59 51.1	4.0	90 51 31.6	4 17 14.0
4.5	19 7 16.1	3 34 32.3	4.5	63 36 57.9	5 1 14.7	4.5	97 0 35.4	3 59 10.0
5.0	25 3 58.2	3 56 36.4	5.0	69 36 3.2	4 59 19.3	5.0	103 11 44.1	3 38 9.1
5.5	31 0 1.9	4 16 3.0	5.5	75 36 21.2	4 54 4.2	5.5	109 25 7.7	3 14 22.5
6.0	36 55 40.5	+4 32 41.2	6.0	81 38 6.3	+4 45 30.6	6.0	115 40 58.3	+2 48 3.6
6.5	42 51 9.2	4 46 21.9	6.5	87 41 35.0	4 33 41.3	6.5	121 59 30.1	2 19 27.7
7.0	48 46 44.0	4 56 57.4	7.0	93 47 6.0	4 18 40.5	7.0	128 20 59.4	1 48 52.1
7.5	54 42 42.9	5 4 21.7	7.5	99 55 0.8	4 0 34.1	7.5	134 45 44.7	1 16 35.9
8.0	60 39 25.6	5 8 29.5	8.0	106 5 42.8	3 39 29.9	8.0	141 14 6.6	0 43 0.5
8.5	66 37 14.1	+5 9 17.2	8.5	112 19 38.1	+3 15 37.1	8.5	147 46 26.2	+0 8 28.9
9.0	72 36 32.5	5 6 42.4	9.0	118 37 14.4	2 49 6.9	9.0	154 23 5.5	-0 26 33.6
9.5	78 37 47.2	5 0 43.9	9.5	124 59 1.0	2 20 12.6	9.5	161 4 25.8	1 1 39.6
10.0	84 41 25.9	4 51 21.6	10.0	131 25 28.0	1 49 9.6	10.0	167 50 46.7	1 36 20.2
10.5	90 47 58.8	4 38 36.6	10.5	137 57 5.2	1 16 15.9	10.5	174 42 24.9	2 10 4.5
11.0	96 57 57.7	+4 22 31.3	11.0	144 34 21.3	+0 41 52.4	11.0	181 39 32.3	-2 42 19.8
11.5	103 11 54.9	4 3 9.9	11.5	151 17 42.5	+0 6 23.1	11.5	188 42 14.4	3 12 32.5
12.0	109 30 23.2	3 40 38.1	12.0	158 7 30.6	-0 29 44.7	12.0	195 50 29.0	3 40 8.4
12.5	115 53 55.1	3 15 4.1	12.5	165 4 1.8	1 6 0.2	12.5	203 4 4.4	4 4 33.6
13.0	122 23 2.0	2 46 38.3	13.0	172 7 24.1	1 41 49.2	13.0	210 22 38.1	4 25 15.9
13.5	128 58 12.6	+2 15 34.5	13.5	179 17 36.2	-2 16 34.6	13.5	217 45 36.2	-4 41 45.6
14.0	135 39 52.1	1 42 9.9	14.0	186 34 24.6	2 49 36.7	14.0	225 12 13.3	4 53 37.5
14.5	142 28 20.3	1 6 45.8	14.5	193 57 23.4	3 20 14.8	14.5	232 41 33.8	5 0 32.1
15.0	149 23 50.3	+0 29 48.0	15.0	201 25 52.6	3 47 48.1	15.0	240 12 32.3	5 2 17.1
15.5	156 26 26.5	-0 8 12.7	15.5	208 58 58.3	4 11 38.0	15.5	247 43 57.1	4 58 48.1
16.0	163 36 3.1	-0 46 41.3	16.0	216 35 34.0	-4 31 10.0	16.0	255 14 32.9	-4 50 9.3
16.5	170 52 22.9	1 24 57.9	16.5	224 14 22.5	4 45 55.6	16.5	262 43 4.5	4 36 33.6
17.0	178 14 55.9	2 2 19.5	17.0	231 53 58.8	4 55 33.6	17.0	270 8 19.8	4 18 21.5
17.5	185 42 59.0	2 38 0.7	17.5	239 32 54.3	4 59 52.2	17.5	277 29 13.5	3 56 0.3
18.0	193 15 36.6	3 11 15.7	18.0	247 9 41.1	4 58 49.3	18.0	284 44 49.3	3 30 2.4
18.5	200 51 41.6	-3 41 20.3	18.5	254 42 56.0	-4 52 32.0	18.5	291 54 22.2	-3 1 3.5
19.0	208 29 57.4	4 7 34.1	19.0	262 11 24.3	4 41 16.2	19.0	298 57 19.2	2 29 40.9
19.5	216 9 1.8	4 29 22.6	19.5	269 34 3.3	4 25 24.9	19.5	305 53 19.7	1 56 32.1
20.0	223 47 29.6	4 46 19.3	20.0	276 50 3.9	4 5 26.8	20.0	312 42 15.0	1 22 13.2
20.5	231 23 57.5	4 58 6.2	20.5	283 58 51.5	3 41 54.1	20.5	319 24 7.4	0 47 18.1
21.0	238 57 6.7	-5 4 35.0	21.0	291 0 5.9	-3 15 21.1	21.0	325 59 8.7	-0 12 18.0
21.5	246 25 47.5	5 5 46.4	21.5	297 53 40.6	2 46 22.3	21.5	332 27 39.0	+0 22 19.2
22.0	253 49 1.5	5 1 49.5	22.0	304 39 41.0	2 15 31.4	22.0	338 50 4.8	0 56 8.9
22.5	261 6 3.0	4 53 0.8	22.5	311 18 23.0	1 43 20.5	22.5	345 6 58.1	1 28 49.2
23.0	268 16 19.9	4 39 41.9	23.0	317 50 10.2	1 10 19.4	23.0	351 18 54.0	2 0 1.0
23.5	275 19 33.1	-4 22 18.7	23.5	324 15 33.0	-0 36 55.5	23.5	357 26 30.6	+2 29 28.1
24.0	282 15 36.6	4 1 19.3	24.0	330 35 5.9	-0 3 33.6	24.0	3 30 26.8	2 56 55.7
24.5	289 4 34.4	3 37 13.2	24.5	336 49 26.6	+0 29 23.5	24.5	9 31 22.5	3 22 11.2
25.0	295 46 40.2	3 10 30.0	25.0	342 59 14.2	1 1 35.5	25.0	15 29 57.2	3 45 3.3
25.5	302 22 15.1	2 41 38.8	25.5	349 5 8.3	1 32 43.7	25.5	21 26 49.0	4 5 21.7
26.0	308 51 45.1	-2 11 7.5	26.0	355 7 47.6	+2 2 31.4	26.0	27 22 34.8	+4 22 57.1
26.5	315 15 40.5	1 39 22.8	26.5	1 7 50.3	2 30 42.8	26.5	33 17 49.5	4 37 41.0
27.0	321 34 33.9	1 6 50.0	27.0	7 5 51.8	2 57 3.6	27.0	39 13 5.4	4 49 25.9
27.5	327 48 58.6	0 33 52.6	27.5	13 2 25.7	3 21 20.3	27.5	45 8 52.4	4 58 4.7
28.0	333 59 28.6	-0 0 53.3	28.0	18 58 2.4	3 43 20.5	28.0	51 5 37.1	5 3 31.3
28.5	340 6 36.4	+0 31 46.8	28.5	24 53 10.0	+4 2 52.4	28.5	57 3 43.2	+5 5 40.8
29.0	346 10 53.5	1 3 48.0	29.0	30 48 12.9	4 19 45.4	29.0	63 3 30.8	5 4 29.1
29.5	352 12 49.3	1 34 51.2	29.5	36 43 32.7	4 33 49.5	29.5	69 5 17.3	4 59 53.5
30.0	358 12 50.9	2 4 38.6	30.0	42 39 27.6	4 44 55.9	30.0	75 9 16.6	4 51 53.4
30.5	4 11 22.7	2 32 53.3	30.5	48 36 13.5	4 52 57.0	30.5	81 15 39.7	4 40 29.8
31.0	10 8 46.5	+2 59 19.3	31.0	54 34 3.1	+4 57 46.5	31.0	87 24 34.5	+4 25 45.8
31.5	16 5 21.9	+3 23 41.7	31.5	60 33 7.1	+4 59 19.5	31.5	93 36 6.9	+4 7 46.8

GREENWICH MEAN NOON.

Date.	MOON'S EQUATOR. i Inclination to the Earth's Equator.	Δ Ascending Node on Earth's Equator to Ascending Node on Ecliptic.	☊′ Ascending Node on Earth's Equator.	Γ′ Longitude of the Moon's Perigee. Daily Motion, +6′.684.	☊ Mean Longitude of Moon's Ascending Node. Daily Motion, −3′.177.	☾ Moon's Mean Longitude.
	° ′	° ′	° ′	° ′	° ′	° ′
Jan. 0	21 57.1	167 40.1	0 49.4	183 56.1	348 25.6	321 21.8
10	21 57.2	167 6.3	0 51.6	185 3.0	347 53.8	93 7.7
20	21 57.4	166 32.5	0 53.9	186 9.8	347 22.1	224 53.5
30	21 57.7	165 58.7	0 56.1	187 16.7	346 50.3	356 39.3
Feb. 9	21 57.9	165 24.9	0 58.3	188 23.5	346 18.5	128 25.2
19	21 58.1	164 51.1	1 0.5	189 30.4	345 46.7	260 11.0
Mar. 1	21 58.3	164 17.3	1 2.7	190 37.2	345 15.0	31 56.9
11	21 58.5	163 43.5	1 4.8	191 44.0	344 43.2	163 42.7
21	21 58.8	163 9.7	1 7.0	192 50.9	344 11.4	295 28.5
31	21 59.0	162 35.9	1 9.2	193 57.7	343 39.7	67 14.4
Apr. 10	21 59.3	162 2.1	1 11.4	195 4.6	343 7.9	199 0.2
20	21 59.6	161 28.4	1 13.5	196 11.4	342 36.1	330 46.1
30	21 59.8	160 54.6	1 15.7	197 18.2	342 4.3	102 31.9
May 10	22 0.1	160 20.9	1 17.8	198 25.1	341 32.6	234 17.7
20	22 0.4	159 47.1	1 20.0	199 31.9	341 0.8	6 3.6
30	22 0.7	159 13.4	1 22.1	200 38.8	340 29.0	137 49.4
June 9	22 1.0	158 39.7	1 24.2	201 45.6	339 57.3	269 35.2
19	22 1.3	158 6.0	1 26.3	202 52.5	339 25.5	41 21.1
29	22 1.6	157 32.3	1 28.4	203 59.3	338 53.7	173 6.9
July 9	22 2.0	156 58.6	1 30.5	205 6.1	338 21.9	304 52.8
19	22 2.3	156 24.9	1 32.6	206 13.0	337 50.2	76 38.6
29	22 2.6	155 51.2	1 34.7	207 19.8	337 18.4	208 24.4
Aug. 8	22 3.0	155 17.5	1 36.7	208 26.7	336 46.6	340 10.3
18	22 3.4	154 43.9	1 38.8	209 33.5	336 14.8	111 56.1
28	22 3.7	154 10.2	1 40.8	210 40.4	335 43.1	243 41.9
Sept. 7	22 4.1	153 36.6	1 42.9	211 47.2	335 11.3	15 27.8
17	22 4.5	153 2.9	1 44.9	212 54.0	334 39.5	147 13.6
27	22 4.9	152 29.3	1 46.9	214 0.9	334 7.8	278 59.5
Oct. 7	22 5.3	151 55.7	1 48.9	215 7.7	333 36.0	50 45.3
17	22 5.7	151 22.1	1 50.9	216 14.6	333 4.2	182 31.1
27	22 6.1	150 48.5	1 52.9	217 21.4	332 32.4	314 17.0
Nov. 6	22 6.5	150 14.9	1 54.8	218 28.3	332 0.7	86 2.8
16	22 6.9	149 41.3	1 56.8	219 35.1	331 28.9	217 48.7
26	22 7.3	149 7.8	1 58.7	220 41.9	330 57.1	349 34.5
Dec. 6	22 7.8	148 34.2	2 0.7	221 48.8	330 25.3	121 20.3
16	22 8.2	148 0.7	2 2.6	222 55.6	329 53.6	253 6.2
26	22 8.7	147 27.2	2 4.5	224 2.5	329 21.8	24 52.0
36	22 9.1	146 53.7	2 6.4	225 9.3	328 50.0	156 37.8

Mean Solar Days.	Motion of Moon in Mean Longitud
	° ′
0.1	1 19.
0.2	2 38.
0.3	3 57.
0.4	5 16.
0.5	6 35.
0.6	7 54.
0.7	9 13.
0.8	10 32.
0.9	11 51.
1.0	13 10.
2.0	26 21.
3.0	39 31.7
4.0	52 42.3
5.0	65 52.9
6.0	79 3.
7.0	92 14.0
8.0	105 24.6
9.0	118 35.2
10.0	131 45.8
Hours.	° ′
1	0 32.9
2	1 5.8
3	1 38.8
4	2 11.7
5	2 44.7
6	3 17.6
7	3 50.5
8	4 23.5
9	4 56.4
10	5 29.4
11	6 2.3
12	6 35.2
13	7 8.2
14	7 41.1
15	8 14.11
16	8 47.0
17	9 20.0
18	9 52.94
19	10 25.88
20	10 58.8
21	11 31.76
22	12 4.70
23	12 37.64

QUANTITIES REQUIRED IN COMPUTING THE MOON'S LIBRATION.

Argument, (☊−λ), or (☊−λ−180°).

☊−λ	μ	$\frac{1}{A}$	B	☊−λ
°	′		° ′	°
0	0.0	37	0 0.0	180
2	0.0	37	0 3.2	178
4	0.1	37	0 6.4	176
6	0.1	38	0 9.6	174
8	0.2	38	0 12.8	172
10	0.2	38	0 16.0	170
12	0.3	38	0 19.2	168
14	0.3	38	0 22.3	166
16	0.3	39	0 25.4	164
18	0.4	39	0 28.5	162
20	0.4	40	0 31.5	160
22	0.4	40	0 34.5	158
24	0.5	41	0 37.5	156
26	0.5	42	0 40.4	154
28	0.5	42	0 43.2	152
30	0.5	43	0 46.1	150
32	0.6	44	0 48.8	148
34	0.6	45	0 51.5	146
36	0.6	46	0 54.1	144
38	0.6	47	0 56.7	142
40	0.6	49	0 59.2	140
42	0.6	50	1 1.6	138
44	0.6	52	1 4.0	136
46	0.6	54	1 6.3	134
48	0.6	56	1 8.5	132
50	0.6	58	1 10.6	130
52	0.6	61	1 12.6	128
54	0.6	64	1 14.5	126
56	0.6	67	1 16.4	124
58	0.6	70	1 18.1	122
60	0.5	75	1 19.8	120
62	0.5	80	1 21.3	118
64	0.5	85	1 22.8	116
66	0.5	92	1 24.1	114
68	0.4	100	1 25.4	112
70	0.4	109	1 26.5	110
72	0.4	121	1 27.6	108
74	0.3	135	1 28.5	106
76	0.3	154	1 29.4	104
78	0.3	180	1 30.1	102
80	0.2	215	1 30.7	100
82	0.2	268	1 31.2	98
84	0.1	357	1 31.6	96
86	0.1	535	1 31.9	94
88	0.0	1070	1 32.0	92
90	0.0	∞	1 32.1	90

μ has the sign of tan (λ−☊)
A has the sign of cos (☊−λ)
B has the sign of sin (☊−λ)
See formulæ, page xii.

SUN'S ABERRATION AND HORIZONTAL PARALLAX.

For Greenwich Mean Noon.

Date.		Aberration.	Hor. Par.
1914.		″	″
Jan.	0	−20.81	8.95
	10	20.81	8.95
	20	20.80	8.94
	30	20.77	8.93
Feb.	9	20.74	8.92
	19	−20.70	8.90
Mar.	1	20.65	8.88
	11	20.59	8.86
	21	20.54	8.83
	31	20.48	8.81
Apr.	10	−20.42	8.78
	20	20.36	8.76
	30	20.31	8.73
May	10	20.26	8.71
	20	20.22	8.69
	30	−20.18	8.68
June	9	20.16	8.67
	19	20.14	8.66
	29	20.13	8.65
July	9	20.13	8.66
	19	−20.14	8.66
	29	20.16	8.67
Aug.	8	20.18	8.68
	18	20.22	8.70
	28	20.26	8.72
Sept.	7	−20.31	8.74
	17	20.37	8.76
	27	20.42	8.78
Oct.	7	20.48	8.81
	17	20.54	8.83
	27	−20.60	8.86
Nov.	6	20.65	8.88
	16	20.70	8.90
	26	20.74	8.92
Dec.	6	20.77	8.93
	16	−20.80	8.94
	26	20.81	8.95
	36	−20.81	8.95

Sun's Mean Equatorial Horizontal Parallax.

8″.80; log=0.94448.

(CONSTANTS OF PARIS CONFERENCE.)

FOR GREENWICH MEAN NOON.

Date.	Precession in Longitude from 1914.0.	Nutation.			Obliquity of Ecliptic. (*Newcomb.*)	Date.	Precession in Longitude from 1914.0.	Nutation.			Obliquit of Ecliptic (*Newcom*
		δ′ψ In Longitude.	δ′a In R. A.	δ′ω In Obliquity.				δ′ψ In Longitude.	δ′a In R. A.	δ′ω In Obliquity.	
	″	″	s	″	23° 27′ ″		″	″	s	″	23° 27′ ″
Jan. 0	− 0.10	+3.77	+0.231	+8.42	10.12	July 4	+25.35	+6.62	+0.405	+8.02	9.49
5	+ 0.59	4.07	0.249	8.45	10.14	9	26.04	6.87	0.420	8.05	9.51
10	1.28	4.35	0.266	8.49	10.18	14	26.73	7.10	0.434	8.09	9.54
15	1.97	4.61	0.281	8.55	10.23	19	27.42	7.30	0.446	8.14	9.58
20	2.65	4.83	0.295	8.62	10.30	24	28.11	7.47	0.456	8.20	9.64
25	+ 3.34	+5.01	+0.306	+8.70	10.37	29	+28.79	+7.61	+0.465	+8.27	9.70
30	4.03	5.15	0.315	8.79	10.45	Aug. 3	29.48	7.73	0.472	8.34	9.76
Feb. 4	4.72	5.26	0.322	8.88	10.53	8	30.17	7.81	0.478	8.41	9.82
9	5.41	5.33	0.326	8.96	10.61	13	30.86	7.85	0.480	8.48	9.89
14	6.09	5.36	0.328	9.05	10.69	18	31.55	7.86	0.481	8.55	9.96
19	+ 6.78	+5.34	+0.327	+9.12	10.76	23	+32.23	+7.85	+0.480	+8.62	10.02
24	7.47	5.29	0.324	9.19	10.82	28	32.92	7.80	0.477	8.68	10.07
Mar. 1	8.16	5.22	0.319	9.25	10.87	Sept. 2	33.61	7.72	0.472	8.73	10.11
6	8.85	5.12	0.313	9.29	10.91	7	34.30	7.62	0.466	8.76	10.14
11	9.53	5.00	0.306	9.32	10.93	12	34.98	7.49	0.458	8.79	10.16
16	+10.22	+4.87	+0.298	+9.34	10.94	17	+35.67	+7.35	+0.450	+8.80	10.17
21	10.91	4.73	0.289	9.34	10.94	22	36.36	7.21	0.441	8.79	10.16
26	11.60	4.59	0.280	9.32	10.91	27	37.05	7.07	0.432	8.77	10.13
31	12.28	4.45	0.272	9.28	10.87	Oct. 2	37.74	6.93	0.423	8.74	10.09
Apr. 5	12.97	4.34	0.265	9.23	10.81	7	38.42	6.80	0.416	8.69	10.03
10	+13.66	+4.23	+0.259	+9.17	10.74	12	+39.11	+6.68	+0.409	+8.62	9.95
15	14.35	4.15	0.254	9.09	10.65	17	39.80	6.59	0.403	8.53	9.86
20	15.04	4.09	0.250	9.00	10.56	22	40.49	6.52	0.399	8.44	9.76
25	15.72	4.07	0.249	8.90	10.46	27	41.18	6.49	0.397	8.33	9.65
30	16.41	4.09	0.250	8.80	10.35	Nov. 1	41.86	6.50	0.397	8.23	9.53
May 5	+17.10	+4.13	+0.253	+8.70	10.24	6	+42.55	+6.54	+0.400	+8.11	9.41
10	17.79	4.20	0.257	8.60	10.13	11	43.24	6.62	0.405	7.99	9.28
15	18.48	4.32	0.264	8.50	10.03	16	43.93	6.75	0.413	7.87	9.16
20	19.16	4.47	0.273	8.40	9.92	21	44.61	6.91	0.422	7.76	9.05
25	19.85	4.65	0.284	8.31	9.82	26	45.30	7.10	0.434	7.66	8.94
30	+20.54	+4.85	+0.297	+8.23	9.73	Dec. 1	+45.99	+7.32	+0.448	+7.57	8.84
June 4	21.23	5.08	0.311	8.16	9.66	6	46.68	7.58	0.464	7.49	8.76
9	21.91	5.32	0.325	8.11	9.60	11	47.37	7.86	0.481	7.43	8.69
14	22.60	5.57	0.341	8.07	9.56	16	48.05	8.15	0.498	7.38	8.63
19	23.29	5.83	0.357	8.04	9.52	21	48.74	8.46	0.517	7.34	8.59
24	+23.98	+6.10	+0.373	+8.02	9.49	26	+49.43	+8.77	+0.536	+7.33	8.57
29	24.67	6.37	0.389	8.01	9.48	31	50.12	9.07	0.554	7.33	8.56
July 4	+25.35	+6.62	+0.405	+8.02	9.49	36	+50.81	+9.35	+0.572	+7.35	8.57

	″	
Precession for 1914 . .	50.2595	log=1.70122
Precession in a Solar day	0.1376	log=9.13862
Precession in a Sidereal day	0.1372	log=9.13735

The short-period terms of the Nutation are given for Washington midnight on pp. 231–232.

Mean Obliquity, 1914.0	° ′ ″
Newcomb	23 27 1.70
Hansen	23 27 1.47
Le Verrier	23 27 1.37
Peters	23 27 1.27

PART II.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

The constants of precession, nutation and aberration adopted by the *Conférence Internationale des Étoiles Fondamentales* which met in Paris in May, 1896, are given on page xiv, and together with the notation of Bessel are used in the formulæ which follow.

BESSELIAN STAR-NUMBERS.

Terms of Long Period.	*Terms of Short Period.*
$A=\tau-0.342\,19\sin\text{☊}$	$-0.004\,05\sin 2\text{☾}$
$+0.004\,15\sin 2\text{☊}$	$+0.000\,23\sin(\text{☾}+\Gamma')$
$-0.025\,26\sin 2\,\mathrm{L}$	$+0.001\,34\sin(\text{☾}-\Gamma')$
$+0.002\,51\sin(\mathrm{L}-\Gamma)$	$-0.000\,68\sin(2\text{☾}-\text{☊})$
$-0.000\,99\sin(3\,\mathrm{L}-\Gamma)$	$-0.000\,52\sin(3\text{☾}-\Gamma')$
$+0.000\,42\sin(\mathrm{L}+\Gamma)$	$+0.000\,30\sin(\text{☾}-2\,\mathrm{L}+\Gamma')$
$+0.000\,25\sin(2\,\mathrm{L}-\text{☊})$	$+0.000\,12\sin 2(\text{☾}-\mathrm{L})$
$''$	$''$
$B=-9.210\cos\text{☊}$	$-0.088\cos 2\text{☾}$
$+0.090\cos 2\text{☊}$	$-0.018\cos(2\text{☾}-\text{☊})$
$-0.552\cos 2\,\mathrm{L}$	$-0.011\cos(3\text{☾}-\Gamma')$
$-0.022\cos(3\,\mathrm{L}-\Gamma)$	$+0.005\cos(\text{☾}+\Gamma')$
$+0.009\cos(\mathrm{L}+\Gamma)$	
$+0.007\cos(2\,\mathrm{L}-\text{☊})$	

$C=-20.4700\cos\omega\cos\odot$

$D=-20.4700\sin\odot$

$E=-0.0418\sin\text{☊}+0''.0005\sin 2\text{☊}-0''.0031\sin 2\,\mathrm{L}$

BESSEL's *Star-Constants.*

$a=3^s.072\,60+1^s.336\,38\sin\alpha_0\tan\delta_0$	$a'=20''.0456\cos\alpha_0$
$b=\frac{1}{15}\cos\alpha_0\tan\delta_0$	$b'=-\sin\alpha_0$
$c=\frac{1}{15}\cos\alpha_0\sec\delta_0$	$c'=\tan\omega\cos\delta_0-\sin\alpha_0\sin\delta_0$
$d=\frac{1}{15}\sin\alpha_0\sec\delta_0$	$d'=\cos\alpha_0\sin\delta_0$

Formulæ for Reduction to Apparent Position.

$$*\,\alpha=\alpha_0+\tau\mu+Aa+Bb+Cc+Dd+\tfrac{1}{15}E \qquad \text{(in time)}$$
$$\delta=\delta_0+\tau\mu'+Aa'+Bb'+Cc'+Dd' \qquad \text{(in arc)}$$

INDEPENDENT STAR-NUMBERS.

$$f+f'=+46''.0889\,A+E\ \text{(in arc)}=3^s.072\,60\,A+\tfrac{1}{15}E \qquad \text{(in time)}$$
$$f'=-0^s.0124\sin 2\text{☾}+0^s.0041\sin(\text{☾}-\Gamma')+0^s.0007\sin(\text{☾}+\Gamma')$$
$$-0^s.0021\sin(2\text{☾}-\text{☊})-0^s.0016\sin(3\text{☾}-\Gamma')$$
$$+0^s.0009\sin(\text{☾}-2\,\mathrm{L}+\Gamma')+0^s.0004\sin 2(\text{☾}-\mathrm{L})$$

$g\sin G=B$ $\qquad$ $h\sin H=C$ $\qquad$ $i=C\tan\omega$

$g\cos G=20''.0456\,A$ $\qquad$ $h\cos H=D$

Formulæ for Reduction to Apparent Position.

$$*\,\alpha=\alpha_0+f+f'+\tau\mu+\tfrac{1}{15}g\sin(G+\alpha_0)\tan\delta_0+\tfrac{1}{15}h\sin(H+\alpha_0)\sec\delta_0 \qquad \text{(in time)}$$
$$\delta=\delta_0+\tau\mu'+g\cos(G+\alpha_0)+h\cos(H+\alpha_0)\sin\delta_0+i\cos\delta_0 \qquad \text{(in arc)}$$

In the above formulæ,

τ denotes the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1914, January $0^d.490$, Washington mean time),

α_0, δ_0, the star's mean R. A. and Decl. at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the Sun's true longitude,	ω, the obliquity of the ecliptic,
L, the Sun's mean longitude,	Γ, the long. of the Sun's perigee,
☊, the longitude of the Moon's ascending node,	Γ', the long. of the Moon's perigee,
	☾, the Moon's mean longitude.

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* See page 217 for statement concerning the use of these formulæ.

The independent star-numbers are more convenient than BESSEL'S, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy.

In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, with the star-numbers of this Ephemeris, the quantities to be computed are $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca', -Db'$.

In the computation of the independent star-numbers given for Washington mean midnight of each day of the year, on pages 222–229, the short-period terms—that is, the terms involving the Moon's mean longitude—have been included in the two columns headed G and Log g. The quantities f and f' correspond to f' and f'', respectively, as given on the page of constants in Part IV of the American Ephemeris for the years 1901 to 1911, inclusive, and are tabulated in the third and fourth columns, respectively, giving separately the effect of the long-period and short-period terms. f' differs but slightly from the term $-0''.1866 \sin 2☾ + 0''.0622 \sin (☾ - \Gamma')$ given on page 37 of the *Procès-Verbaux* of the Paris Conference, and also on page 289 of the American Ephemeris and Nautical Almanac for 1900. In computing the reduction of stars from mean to apparent place, or vice versa, using the independent star-numbers, the quantity f' (which is the same for all stars) should be omitted in using the formulæ for α on page 216, in case it is desired to make the reduction in conformity with the decision of the Paris Conference with reference to this matter. See page of *Procès-Verbaux* above cited.

In the computation of the Besselian star-numbers, pages 218–221, all short-period terms have been included, and hence in using these quantities in the reduction of stars to apparent place by means of the formulæ for that purpose on page 216, f' must be subtracted from the final result if it is desired, in compliance with the decision of the Paris Conference, to omit that quantity.

In computing the ephemerides of the circumpolar stars in this volume, all short-period terms have been included, excepting the quantity f' above mentioned, which has been omitted.

In the computation of the ephemerides of the ten-day stars, no short-period terms have been included. These terms attain two maxima and two minima during the tropical month. At maximum and minimum they may amount in right ascension to $\pm 0^s.008 \tan \delta$, and in declination to $\pm 0''.13$. For computing the effect of these terms for the correction of the positions of stars interpolated from the ten-day ephemerides, the following formulæ may be used, in which $\varDelta\alpha$ and $\varDelta\delta$ denote the effect of the short-period terms in right ascension and declination, respectively, and $\delta''\psi$ and $\delta''\omega$, the sum of the short-period terms of the nutation in longitude and obliquity:

$$\varDelta\alpha = D'_{\psi}\alpha\ \delta''\psi + D_{\omega}\alpha\ \delta''\omega$$
$$\varDelta\delta = D_{\psi}\delta\ \delta''\psi + D_{\omega}\delta\ \delta''\omega$$

The values of $\delta''\psi$ and of $\delta''\omega$ for Washington mean midnight are given for each day of the year on pages 231–232, and have been computed as follows:

$$\delta''\psi = 50''.37\, A_2 \qquad \delta''\omega = -B_2$$

in which A_2 and B_2 are the sums of the short-period terms given in the expressions for A and B on page 216.

The quantities $D'_{\psi}\alpha$, $D_{\omega}\alpha$, $D_{\psi}\delta$, and $D_{\omega}\delta$ are given for each ten-day star on pages 287–486, and have been computed by means of the following formulæ:

$$D'_{\psi}\alpha = \tfrac{1}{15} \sin \alpha \tan \delta \sin \omega \qquad D_{\omega}\alpha = -\tfrac{1}{15} \cos \alpha \tan \delta$$
$$D_{\psi}\delta = \cos \alpha \sin \omega \qquad D_{\omega}\delta = \sin \alpha$$

The complete derivative of the right ascension with reference to ψ is

$$D_{\psi}\alpha = \tfrac{1}{15} (\cos \omega + \sin \alpha \tan \delta \sin \omega)$$

and the omission of the term $\frac{1}{15} \cos \omega$ is made in accordance with the above-mentioned decision of the Paris Conference with reference to the quantity f'.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
Jan.	0	+8.90331	−0.9282	−0.51201	+1.30451	Feb.	15	+9.35857	−0.9585	−1.19582	+1.05064
	1	8.91513	0.9299	0.55383	1.30308		16	9.36436	0.9567	1.20074	1.03876
	2	8.92460	0.9307	0.59184	1.30151		17	9.37192	0.9553	1.20548	1.02642
	3	8.93359	0.9307	0.62667	1.29979		18	9.38052	0.9548	1.21003	1.01358
	4	8.94379	0.9298	0.65878	1.29793		19	9.38928	0.9554	1.21440	1.00021
h (7.0)	5	+8.95641	−0.9284	−0.68854	+1.29592	h (10.0)	20	+9.39731	−0.9571	−1.21859	+0.98629
	6	8.97223	0.9266	0.71626	1.29377		21	9.40390	0.9596	1.22261	0.97178
	7	8.99140	0.9249	0.74219	1.29147		22	9.40872	0.9624	1.22646	0.95663
	8	9.01338	0.9236	0.76652	1.28902		23	9.41184	0.9651	1.23014	0.94080
	9	9.03694	0.9232	0.78943	1.28642		24	9.41359	0.9673	1.23365	0.92424
	10	+9.06036	−0.9239	−0.81106	+1.28366		25	+9.41444	−0.9688	−1.23700	+0.90689
	11	9.08189	0.9258	0.83153	1.28075		26	9.41491	0.9695	1.24019	0.88869
	12	9.10011	0.9287	0.85094	1.27768		27	9.41554	0.9693	1.24322	0.86956
	13	9.11418	0.9320	0.86939	1.27445		28	9.41681	0.9685	1.24610	0.84943
	14	9.12408	0.9351	0.88696	1.27106	Mar.	1	9.41905	0.9672	1.24882	0.82819
	15	+9.13064	−0.9374	−0.90371	+1.26750		2	+9.42254	−0.9656	−1.25139	+0.80572
	16	9.13535	0.9386	0.91970	1.26377		3	9.42739	0.9641	1.25381	0.78191
	17	9.14011	0.9384	0.93499	1.25988		4	9.43340	0.9632	1.25609	0.75659
	18	9.14675	0.9371	0.94963	1.25581		5	9.44018	0.9631	1.25822	0.72957
	19	9.15631	0.9353	0.96366	1.25156		6	9.44713	0.9640	1.26021	0.70064
h (8.0)	20	+9.16890	−0.9334	−0.97711	+1.24713	h (11.0)	7	+9.45347	−0.9658	−1.26206	+0.66952
	21	9.18382	0.9322	0.99003	1.24253		8	9.45853	0.9683	1.26377	0.63588
	22	9.19973	0.9320	1.00244	1.23774		9	9.46202	0.9710	1.26533	0.59928
	23	9.21511	0.9332	1.01437	1.23275		10	9.46398	0.9733	1.26676	0.55920
	24	9.22874	0.9353	1.02584	1.22757		11	9.46475	0.9747	1.26806	0.51492
	25	+9.23985	−0.9382	−1.03688	+1.22219		12	+9.46502	−0.9749	−1.26922	+0.46548
	26	9.24822	0.9413	1.04751	1.21660		13	9.46564	0.9738	1.27024	0.40957
	27	9.25418	0.9442	1.05775	1.21080		14	9.46737	0.9718	1.27113	0.34527
	28	9.25829	0.9466	1.06762	1.20479		15	9.47070	0.9694	1.27188	0.26963
	29	9.26126	0.9482	1.07714	1.19856		16	9.47561	0.9671	1.27250	0.17790
	30	+9.26389	−0.9489	−1.08631	+1.19210		17	+9.48162	−0.9656	−1.27299	+0.06133
	31	9.26687	0.9489	1.09516	1.18540		18	9.48805	0.9651	1.27335	9.90141
Feb.	1	9.27078	0.9481	1.10369	1.17847		19	9.49409	0.9657	1.27358	9.64551
	2	9.27618	0.9470	1.11193	1.17129		20	9.49919	0.9672	1.27368	+8.94103
	3	9.28344	0.9457	1.11987	1.16385		21	9.50300	0.9692	1.27365	−9.42705
h (9.0)	4	+9.29248	−0.9448	−1.12753	+1.15615	h (12.0)	22	+9.50543	−0.9712	−1.27348	−9.79359
	5	9.30285	0.9444	1.13492	1.14817		23	9.50667	0.9728	1.27318	9.98933
	6	9.31387	0.9451	1.14206	1.13990		24	9.50709	0.9738	1.27276	0.12360
	7	9.32459	0.9469	1.14894	1.13134		25	9.50713	0.9739	1.27221	0.22587
	8	9.33405	0.9496	1.15558	1.12248		26	9.50723	0.9732	1.27153	0.30843
	9	+9.34149	−0.9529	−1.16198	+1.11330		27	+9.50779	−0.9717	−1.27071	−0.37764
	10	9.34666	0.9562	1.16816	1.10378		28	9.50909	0.9697	1.26976	0.43717
	11	9.34971	0.9589	1.17411	1.09392		29	9.51136	0.9674	1.26869	0.48936
	12	9.35137	0.9606	1.17985	1.08369		30	9.51474	0.9650	1.26748	0.53581
	13	9.35272	0.9610	1.18537	1.07308		31	9.51921	0.9631	1.26614	0.57763
	14	+9.35482	−0.9602	−1.19069	+1.06207	Apr.	1	+9.52446	−0.9619	−1.26467	−0.61563
	15	+9.35857	−0.9585	−1.19582	+1.05064		2	+9.52997	−0.9616	−1.26306	−0.65043

$E = +0''.01 = +0^s.001$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Apr. 1	+9.52446	−0.9619	−1.26467	−0.61563	May 17	+9.66859	−0.9305	−1.01651	−1.23181
2	9.52997	0.9616	1.26306	0.65043	18	9.66982	0.9304	1.00532	1.23657
3	9.53519	0.9624	1.26132	0.68251	19	9.67093	0.9295	0.99371	1.24115
4	9.53964	0.9639	1.25945	0.71224	20	9.67219	0.9276	0.98165	1.24556
5	9.54294	0.9657	1.25744	0.73993	21	9.67388	0.9251	0.96913	1.24981
h (13.0) 6	+9.54499	−0.9674	−1.25529	−0.76582	h (16.0) 22	+9.67621	−0.9221	−0.95612	−1.25389
7	9.54597	0.9683	1.25301	0.79012	23	9.67924	0.9190	0.94258	1.25781
8	9.54636	0.9681	1.25059	0.81299	24	9.68300	0.9161	0.92849	1.26158
9	9.54687	0.9667	1.24803	0.83459	25	9.68741	0.9138	0.91380	1.26519
10	9.54823	0.9641	1.24532	0.85503	26	9.69219	0.9125	0.89848	1.26864
11	+9.55088	−0.9609	−1.24247	−0.87442	27	+9.69700	−0.9123	−0.88247	−1.27195
12	9.55492	0.9577	1.23948	0.89285	28	9.70149	0.9132	0.86574	1.27511
13	9.56008	0.9550	1.23634	0.91040	29	9.70530	0.9148	0.84822	1.27813
14	9.56584	0.9534	1.23306	0.92713	30	9.70823	0.9167	0.82982	1.28100
15	9.57152	0.9529	1.22962	0.94312	31	9.71031	0.9182	0.81051	1.28373
16	+9.57654	−0.9535	−1.22602	−0.95841	June 1	+9.71176	−0.9188	−0.79018	−1.28632
17	9.58050	0.9547	1.22227	0.97305	2	9.71297	0.9181	0.76872	1.28878
18	9.58330	0.9561	1.21837	0.98708	3	9.71444	0.9160	0.74604	1.29110
19	9.58508	0.9572	1.21430	1.00055	4	9.71665	0.9130	0.72198	1.29329
20	9.58607	0.9577	1.21007	1.01348	5	9.71981	0.9094	0.69639	1.29535
h (14.0) 21	+9.58663	−0.9575	−1.20567	−1.02591	h (17.0) 6	+9.72391	−0.9062	−0.66908	−1.29727
22	9.58719	0.9563	1.20110	1.03786	7	9.72870	0.9038	0.63981	1.29906
23	9.58802	0.9544	1.19636	1.04937	8	9.73376	0.9027	0.60831	1.30073
24	9.58943	0.9518	1.19144	1.06046	9	9.73862	0.9030	0.57422	1.30227
25	9.59166	0.9488	1.18634	1.07114	10	9.74294	0.9043	0.53709	1.30369
26	+9.59483	−0.9458	−1.18106	−1.08143	11	+9.74644	−0.9063	−0.49637	−1.30498
27	9.59889	0.9431	1.17559	1.09136	12	9.74911	0.9084	0.45130	1.30614
28	9.60362	0.9410	1.16992	1.10094	13	9.75107	0.9100	0.40089	1.30718
29	9.60872	0.9399	1.16406	1.11018	14	9.75253	0.9109	0.34370	1.30810
30	9.61377	0.9398	1.15799	1.11910	15	9.75378	0.9108	0.27770	1.30890
May 1	+9.61833	−0.9407	−1.15171	−1.12772	16	+9.75509	−0.9098	−0.19970	−1.30957
2	9.62200	0.9421	1.14522	1.13605	17	9.75667	0.9080	0.10442	1.31012
3	9.62457	0.9435	1.13851	1.14409	18	9.75869	0.9058	9.98203	1.31055
4	9.62616	0.9444	1.13157	1.15185	19	9.76133	0.9032	9.81084	1.31086
5	9.62718	0.9442	1.12440	1.15936	20	9.76456	0.9009	9.52397	1.31105
h (15.0) 6	+9.62817	−0.9428	−1.11699	−1.16661	h (18.0) 21	+9.76829	−0.8990	−8.33013	−1.31112
7	9.62969	0.9401	1.10932	1.17362	22	9.77238	0.8981	+9.46448	1.31107
8	9.63215	0.9366	1.10139	1.18039	23	9.77659	0.8983	9.78108	1.31089
9	9.63583	0.9328	1.09319	1.18693	24	9.78063	0.8997	9.96214	1.31060
10	9.64060	0.9295	1.08472	1.19325	25	9.78419	0.9019	0.08944	1.31019
11	+9.64600	−0.9271	−1.07596	−1.19936	26	+9.78704	−0.9047	+0.18766	−1.30965
12	9.65157	0.9260	1.06689	1.20526	27	9.78912	0.9072	0.26760	1.30900
13	9.65674	0.9261	1.05750	1.21095	28	9.79058	0.9089	0.33497	1.30822
14	9.66111	0.9271	1.04779	1.21645	20	9.79170	0.9095	0.39318	1.30732
15	9.66451	0.9284	1.03773	1.22175	30	9.79285	0.9086	0.44438	1.30630
16	+9.66693	−0.9297	−1.02731	−1.22687	July 1	+9.79446	−0.9066	+0.49006	−1.30516
17	+9.66859	−0.9305	−1.01651	−1.23181	2	+9.79679	−0.9039	+0.53128	−1.30389

$E = +0''.01 = +0^{s}.001$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
July 1	+9.79446	−0.9066	+0.49006	−1.30516	Aug. 16	+9.89192	−0.9257	+1.17857	−1.08604
2	9.79679	0.9039	0.53128	1.30389	17	9.89451	0.9271	1.18388	1.07602
3	9.79996	0.9013	0.56881	1.30250	18	9.89691	0.9295	1.18901	1.06564
4	9.80376	0.8994	0.60324	1.30098	19	9.89890	0.9325	1.19396	1.05488
5	9.80794	0.8987	0.63503	1.29934	h 20	9.90033	0.9357	1.19874	1.04371
h 6	+9.81210	−0.8994	+0.66454	−1.29757	(22.0) 21	+9.90122	−0.9385	+1.20334	−1.03212
(19.0) 7	9.81588	0.9013	0.69205	1.29567	22	9.90167	0.9404	1.20778	1.02007
8	9.81904	0.9040	0.71782	1.29364	23	9.90193	0.9410	1.21205	1.00755
9	9.82146	0.9069	0.74203	1.29149	24	9.90231	0.9403	1.21616	0.99453
10	9.82322	0.9096	0.76485	1.28920	25	9.90312	0.9386	1.22011	0.98098
11	+9.82450	−0.9115	+0.78641	−1.28678	26	+9.90450	−0.9365	+1.22390	−0.96685
12	9.82551	0.9125	0.80684	1.28422	27	9.90645	0.9346	1.22754	0.95212
13	9.82647	0.9126	0.82625	1.28153	28	9.90887	0.9335	1.23103	0.93674
14	9.82759	0.9118	0.84472	1.27870	29	9.91149	0.9336	1.23437	0.92065
15	9.82906	0.9104	0.86231	1.27573	30	9.91397	0.9349	1.23756	0.90382
16	+9.83098	−0.9087	+0.87911	−1.27261	31	+9.91608	−0.9372	+1.24061	−0.88617
17	9.83336	0.9071	0.89517	1.26935	Sept. 1	9.91767	0.9400	1.24351	0.86763
18	9.83621	0.9059	0.91054	1.26594	2	9.91870	0.9428	1.24627	0.84812
19	9.83944	0.9054	0.92528	1.26239	3	9.91924	0.9451	1.24889	0.82757
20	9.84283	0.9060	0.93942	1.25868	4	9.91946	0.9465	1.25138	0.80585
h 21	+9.84616	−0.9077	+0.95299	−1.25482	h 5	+9.91955	−0.9470	+1.25373	−0.78284
(20.0) 22	9.84916	0.9104	0.96604	1.25081	(23.0) 6	9.91969	0.9467	1.25594	0.75840
23	9.85162	0.9136	0.97860	1.24663	7	9.92003	0.9456	1.25802	0.73235
24	9.85344	0.9168	0.99069	1.24229	8	9.92068	0.9440	1.25996	0.70449
25	9.85463	0.9195	1.00233	1.23778	9	9.92171	0.9422	1.26177	0.67457
26	+9.85539	−0.9211	+1,01355	−1.23310	10	+9.92312	−0.9405	+1.26346	−0.64228
27	9.85608	0.9213	1.02438	1.22825	11	9.92488	0.9393	1.26502	0.60724
28	9.85701	0.9203	1.03482	1.22322	12	9.92690	0.9389	1.26644	0.56897
29	9.85849	0.9184	1.04490	1.21801	13	9.92898	0.9394	1.26773	0.52682
30	9.86066	0.9163	1.05464	1.21261	14	9.93098	0.9409	1.26890	0.47997
31	+9.86342	−0.9147	+1.06405	−1.20702	15	+9.93266	−0.9430	+1.26994	−0.42727
Aug. 1	9.86663	0.9141	1.07314	1.20124	16	9.93388	0.9455	1.27085	0.36710
2	9.86995	0.9148	1.08192	1.19525	17	9.93462	0.9478	1.27163	0.29704
3	9.87301	0.9168	1.09041	1.18905	18	9.93494	0.9493	1.27229	0.21325
4	9.87560	0.9197	1.09863	1.18264	19	9.93501	0.9497	1.27282	0.10912
h 5	+9.87755	−0.9229	+1.10658	−1.17601	h 20	+9.93514	−0.9488	+1.27322	−9.97160
(21.0) 6	9.87890	0.9260	1.11427	1.16915	(0.0) 21	9.93558	0.9467	1.27350	9.76886
7	9.87976	0.9285	1.12170	1.16206	22	9.93653	0.9440	1.27365	−9.37575
8	9.88033	0.9301	1.12889	1.15472	23	9.93807	0.9413	1.27367	+9.05092
9	9.88080	0.9307	1.13585	1.14713	24	9.94008	0.9391	1.27357	9.66519
10	+9.88136	−0.9305	+1.14259	−1.13928	25	+9.94236	−0.9380	+1.27334	+9.90995
11	9.88218	0.9296	1.14910	1.13115	26	9.94462	0.9382	1.27298	0.06551
12	9.88338	0.9283	1.15540	1.12274	27	9.94660	0.9394	1.27249	0.17976
13	9.88498	0.9269	1.16149	1.11403	28	9.94813	0.9413	1.27187	0.27007
14	9.88698	0.9258	1.16738	1.10502	29	9.94914	0.9434	1.27113	0.34472
15	+9.88934	−0.9253	+1.17307	−1.09570	30	+9.94966	−0.9450	+1.27026	+0.40832
16	+9.89192	−0.9257	+1.17857	−1.08604	Oct. 1	+9.94983	−0.9460	+1.26925	+0.46370

$E = +0''.02 = +0^{s}.001$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
Oct.	1	+9.94983	−0.9460	+1.26925	+0.46370	Nov.	16	+0.00232	−0.8948	+1.04268	+1.21919
	2	9.94986	0.9460	1.26811	0.51272		17	0.00435	0.8908	1.03194	1.22464
	3	9.94990	0.9450	1.26684	0.55667		18	0.00677	0.8877	1.02079	1.22989
	4	9.95010	0.9433	1.26544	0.59648		19	0.00936	0.8860	1.00921	1.23495
	5	9.95058	0.9409	1.26391	0.63285		20	0.01186	0.8857	0.99716	1.23982
h (1.0)	6	+9.95142	−0.9383	+1.26224	+0.66632	h (4.0)	21	+0.01405	−0.8866	+0.98463	+1.24450
	7	9.95263	0.9357	1.26043	0.69728		22	0.01581	0.8881	0.97158	1.24900
	8	9.95418	0.9335	1.25848	0.72608		23	0.01711	0.8897	0.95798	1.25333
	9	9.95600	0.9319	1.25640	0.75298		24	0.01802	0.8906	0.94380	1.25747
	10	9.95794	0.9313	1.25417	0.77821		25	0.01868	0.8907	0.92900	1.26144
	11	+9.95985	−0.9316	+1.25180	+0.80194		26	+0.01926	−0.8896	+0.91353	+1.26525
	12	9.96155	0.9327	1.24928	0.82434		27	0.01990	0.8876	0.89734	1.26889
	13	9.96289	0.9344	1.24662	0.84553		28	0.02074	0.8848	0.88038	1.27236
	14	9.96379	0.9360	1.24381	0.86562		29	0.02187	0.8815	0.86258	1.27567
	15	9.96428	0.9370	1.24084	0.88471		30	0.02332	0.8782	0.84388	1.27883
	16	+9.96450	−0.9369	+1.23773	+0.90288	Dec.	1	+0.02508	−0.8751	+0.82418	+1.28183
	17	9.96470	0.9356	1.23446	0.92020		2	0.02709	0.8726	0.80340	1.28467
	18	9.96515	0.9330	1.23102	0.93675		3	0.02927	0.8711	0.78143	1.28736
	19	9.96604	0.9296	1.22743	0.95257		4	0.03150	0.8707	0.75813	1.28990
	20	9.96748	0.9258	1.22368	0.96772		5	0.03363	0.8714	0.73335	1.29229
h (2.0)	21	+9.96945	−0.9225	+1.21975	+0.98223	h (5.0)	6	+0.03552	−0.8729	+0.70694	+1.29453
	22	9.97175	0.9202	1.21566	0.99616		7	0.03706	0.8749	0.67866	1.29663
	23	9.97414	0.9191	1.21140	1.00953		8	0.03821	0.8767	0.64822	1.29858
	24	9.97634	0.9193	1.20696	1.02238		9	0.03904	0.8776	0.61534	1.30039
	25	9.97816	0.9204	1.20233	1.03474		10	0.03971	0.8774	0.57962	1.30205
	26	+9.97949	−0.9218	+1.19752	+1.04664		11	+0.04043	−0.8757	+0.54053	+1.30357
	27	9.98034	0.9231	1.19252	1.05810		12	0.04143	0.8728	0.49740	1.30495
	28	9.98082	0.9236	1.18732	1.06913		13	0.04287	0.8691	0.44934	1.30619
	29	9.98111	0.9233	1.18193	1.07977		14	0.04477	0.8655	0.39513	1.30728
	30	9.98137	0.9219	1.17634	1.09004		15	0.04707	0.8626	0.33300	1.30824
	31	+9.98176	−0.9196	+1.17053	+1.09994		16	+0.04961	−0.8611	+0.26030	+1.30907
Nov.	1	9.98240	0.9166	1.16451	1.10949		17	0.05216	0.8612	0.17275	1.30975
	2	9.98338	0.9133	1.15827	1.11871		18	0.05448	0.8626	0.06276	1.31029
	3	9.98470	0.9099	1.15179	1.12762		19	0.05642	0.8650	9.91491	1.31070
	4	9.98634	0.9069	1.14508	1.13622		20	0.05793	0.8676	9.68877	1.31097
h (3.0)	5	+9.98827	−0.9045	+1.13813	+1.14453	h (6.0)	21	+0.05904	−0.8697	+9.18901	+1.31110
	6	9.99036	0.9030	1.13092	1.15256		22	0.05987	0.8710	−9.25380	1.31110
	7	9.99246	0.9026	1.12345	1.16031		23	0.06056	0.8713	9.71036	1.31096
	8	9.99440	0.9030	1.11571	1.16780		24	0.06125	0.8704	9.92789	1.31067
	9	9.99603	0.9042	1.10770	1.17504		25	0.06209	0.8686	0.07206	1.31025
	10	+9.99728	−0.9056	+1.09939	+1.18203		26	+0.06316	−0.8663	−0.18001	+1.30970
	11	9.99814	0.9065	1.09077	1.18878		27	0.06449	0.8638	0.26628	1.30901
	12	9.99871	0.9066	1.08184	1.19530		28	0.06609	0.8616	0.33811	1.30818
	13	9.99918	0.9053	1.07258	1.20160		29	0.06793	0.8599	0.39961	1.30720
	14	9.99982	0.9027	1.06298	1.20768		30	0.06996	0.8591	0.45335	1.30609
	15	+0.00082	−0.8990	+1.05302	+1.21354		31	+0.07204	−0.8594	−0.50104	+1.30484
	16	+0.00232	−0.8948	+1.04268	+1.21919		32	+0.07407	−0.8608	−0.54388	+1.30345

$E = +0''.02 = +0^{s}.001$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log k.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Jan. 0	0.0000	+0.234	+0.013	280 43.1	18 42.9	350 50.4	23 23.4	0.93589	1.31008	−1.41	−0.1493
1	0.0028	0.246	0.007	280 57.9	18 43.8	349 54.0	23 19.6	0.93786	1.30986	1.55	0.1911
2	0.0055	0.258	+0.001	281 10.9	18 44.7	348 57.5	23 15.8	0.93901	1.30962	1.69	0.2291
3	0.0082	0.270	−0.005	281 24.6	18 45.6	348 1.0	23 12.1	0.93932	1.30936	1.84	0.2639
4	0.0110	0.282	0.011	281 41.7	18 46.8	347 4.4	23 8.3	0.93895	1.30908	1.98	0.2960
h (7.0) 5	0.0137	+0.294	−0.015	282 4.2	18 48.3	346 7.7	23 4.5	0.93813	1.30878	−2.12	−0.3258
6	0.0165	0.306	0.017	282 33.1	18 50.2	345 11.0	23 0.7	0.93715	1.30846	2.26	0.3535
7	0.0192	0.318	0.016	283 9.1	18 52.6	344 14.1	22 56.9	0.93644	1.30812	2.40	0.3795
8	0.0219	0.329	0.012	283 50.6	18 55.4	343 17.2	22 53.1	0.93643	1.30776	2.53	0.4038
9	0.0247	0.341	−0.006	284 36.0	18 58.4	342 20.2	22 49.3	0.93748	1.30738	2.67	0.4267
10	0.0274	+0.353	+0.001	285 20.8	19 1.4	341 23.2	22 45.5	0.93971	1.30699	−2.81	−0.4483
11	0.0302	0.364	0.008	286 1.2	19 4.1	340 25.9	22 41.7	0.94304	1.30659	2.94	0.4688
12	0.0329	0.376	0.012	286 34.1	19 6.3	339 28.6	22 37.9	0.94709	1.30616	3.08	0.4882
13	0.0356	0.387	0.013	286 57.5	19 7.8	338 31.2	22 34.1	0.95129	1.30572	3.21	0.5067
14	0.0384	0.398	0.011	287 12.6	19 8.8	337 33.7	22 30.2	0.95499	1.30525	3.34	0.5242
15	0.0411	+0.410	+0.006	287 22.2	19 9.5	336 36.0	22 26.4	0.95769	1.30477	−3.48	−0.5410
16	0.0438	0.421	0.000	287 30.2	19 10.0	335 38.3	22 22.6	0.95915	1.30427	3.61	0.5570
17	0.0466	0.432	−0.007	287 41.5	19 10.8	334 40.4	22 18.7	0.95944	1.30377	3.74	0.5723
18	0.0493	0.443	0.012	287 59.6	19 12.0	333 42.3	22 14.8	0.95890	1.30324	3.86	0.5869
19	0.0521	0.454	0.013	288 26.5	19 13.8	332 44.2	22 10.9	0.95813	1.30271	3.99	0.6009
h (8.0) 20	0.0548	+0.465	−0.011	289 1.3	19 16.1	331 45.9	22 7.1	0.95778	1.30216	−4.12	−0.6144
21	0.0575	0.476	−0.006	289 41.5	19 18.8	330 47.4	22 3.2	0.95835	1.30160	4.24	0.6273
22	0.0603	0.486	+0.001	290 22.2	19 21.5	329 48.8	21 59.3	0.96009	1.30103	4.36	0.6397
23	0.0630	0.497	0.008	290 59.5	19 24.0	328 50.1	21 55.3	0.96297	1.30044	4.48	0.6516
24	0.0657	0.508	0.013	291 30.1	19 26.0	327 51.2	21 51.4	0.96666	1.29985	4.60	0.6631
25	0.0685	+0.518	+0.016	291 52.4	19 27.5	326 52.1	21 47.5	0.97067	1.29925	−4.72	−0.6742
26	0.0712	0.528	0.017	292 6.9	19 28.5	325 52.9	21 43.5	0.97452	1.29863	4.84	0.6848
27	0.0740	0.539	0.014	292 15.3	19 29.0	324 53.6	21 39.6	0.97787	1.29800	4.96	0.6950
28	0.0767	0.549	0.009	292 20.2	19 29.3	323 54.1	21 35.6	0.98049	1.29738	5.07	0.7049
29	0.0794	0.559	+0.003	292 24.0	19 29.6	322 54.4	21 31.6	0.98227	1.29674	5.18	0.7144
30	0.0822	+0.569	−0.004	292 29.3	19 30.0	321 54.6	21 27.6	0.98329	1.29610	−5.29	−0.7236
31	0.0849	0.579	0.010	292 37.8	19 30.5	320 54.6	21 23.6	0.98366	1.29545	5.40	0.7324
Feb. 1	0.0877	0.588	0.014	292 50.9	19 31.4	319 54.5	21 19.6	0.98361	1.29480	5.51	0.7410
2	0.0904	0.598	0.017	293 9.6	19 32.6	318 54.2	21 15.6	0.98347	1.29415	5.61	0.7492
3	0.0931	0.608	0.017	293 34.2	19 34.3	317 53.8	21 11.6	0.98355	1.29348	5.72	0.7571
h (9.0) 4	0.0959	+0.617	−0.014	294 3.6	19 36.2	316 53.2	21 7.5	0.98420	1.29283	−5.82	−0.7648
5	0.0986	0.626	0.008	294 35.2	19 38.3	315 52.4	21 3.5	0.98572	1.29216	5.92	0.7722
6	0.1013	0.636	−0.002	295 6.3	19 40.4	314 51.4	20 59.4	0.98824	1.29149	6.02	0.7793
7	0.1041	0.645	+0.005	295 33.7	19 42.2	313 50.4	20 55.4	0.99165	1.29084	6.11	0.7862
8	0.1068	0.654	0.010	295 54.5	19 43.6	312 49.1	20 51.3	0.99564	1.29017	6.21	0.7920
9	0.1096	+0.663	+0.013	296 7.5	19 44.5	311 47.7	20 47.2	0.99974	1.28951	−6.30	−0.7993
10	0.1123	0.672	0.012	296 13.4	19 44.9	310 46.1	20 43.1	1.00339	1.28886	6.39	0.8054
11	0.1150	0.681	0.008	296 14.5	19 45.0	309 44.4	20 39.0	1.00615	1.28822	6.48	0.8114
12	0.1178	0.689	+0.002	296 14.5	19 45.0	308 42.5	20 34.8	1.00781	1.28757	6.56	0.8171
13	0.1205	0.698	−0.005	296 17.6	19 45.2	307 40.5	20 30.7	1.00838	1.28693	6.65	0.8220
14	0.1232	+0.706	−0.010	296 26.7	19 45.8	306 38.2	20 26.5	1.00815	1.28628	−6.73	−0.8280
15	0.1260	+0.715	−0.012	296 43.6	19 46.9	305 35.8	20 22.4	1.00762	1.28566	−6.81	−0.8331

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	*f*	*f′*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Feb. 15	0.1260	+0.715	−0.012	296 43.6	19 46.9	305 35.8	20 22.4	1.00762	1.28566	−6.81	−0.8331
16	0.1287	0.723	0.011	297 7.9	19 48.5	304 33.3	20 18.2	1.00737	1.28503	6.89	0.8380
17	0.1315	0.731	−0.007	297 36.9	19 50.5	303 30.6	20 14.0	1.00785	1.28442	6.96	0.8428
18	0.1342	0.739	0.000	298 6.8	19 52.4	302 27.7	20 9.8	1.00934	1.28382	7.03	0.8473
19	0.1369	0.747	+0.007	298 33.8	19 54.3	301 24.7	20 5.6	1.01180	1.28323	7.11	0.8517
h (10.0) 20	0.1397	+0.755	+0.013	298 54.9	19 55.7	300 21.5	20 1.4	1.01494	1.28265	−7.18	−0.8559
21	0.1424	0.763	0.016	299 8.7	19 56.6	299 18.2	19 57.2	1.01837	1.28208	7.24	0.8599
22	0.1451	0.771	0.017	299 15.5	19 57.0	298 14.8	19 53.0	1.02166	1.28153	7.31	0.8637
23	0.1479	0.779	0.015	299 16.9	19 57.1	297 11.2	19 48.7	1.02446	1.28098	7.37	0.8674
24	0.1506	0.786	0.011	299 15.2	19 57.0	296 7.5	19 44.5	1.02656	1.28045	7.43	0.8709
25	0.1534	+0.794	+0.005	299 13.1	19 56.9	295 3.7	19 40.2	1.02793	1.27994	−7.49	−0.8743
26	0.1561	0.801	−0.002	299 12.5	19 56.8	293 59.8	19 36.0	1.02856	1.27945	7.54	0.8775
27	0.1588	0.809	0.008	299 15.1	19 57.0	292 55.7	19 31.7	1.02858	1.27896	7.60	0.8805
28	0.1616	0.816	0.013	299 22.1	19 57.5	291 51.6	19 27.4	1.02824	1.27850	7.65	0.8834
Mar. 1	0.1643	0.823	0.016	299 34.3	19 58.3	290 47.3	19 23.2	1.02776	1.27806	7.69	0.8861
2	0.1670	+0.831	−0.017	299 51.6	19 59.4	289 43.0	19 18.9	1.02744	1.27763	−7.74	−0.8887
3	0.1698	0.838	0.015	300 13.2	20 0.9	288 38.5	19 14.6	1.02758	1.27723	7.78	0.8911
4	0.1725	0.845	0.011	300 37.3	20 2.5	287 34.0	19 10.3	1.02841	1.27683	7.82	0.8934
5	0.1753	0.852	−0.005	301 1.3	20 4.1	286 29.4	19 6.0	1.03012	1.27647	7.86	0.8955
6	0.1780	0.859	+0.002	301 22.4	20 5.5	285 24.8	19 1.7	1.03265	1.27611	7.90	0.8975
h (11.0) 7	0.1807	+0.866	+0.008	301 38.2	20 6.5	284 20.1	18 57.3	1.03571	1.27579	−7.93	−0.8993
8	0.1835	0.873	0.011	301 47.3	20 7.2	283 15.3	18 53.0	1.03892	1.27550	7.96	0.9010
9	0.1862	0.880	0.011	301 50.2	20 7.5	282 10.5	18 48.7	1.04183	1.27521	7.99	0.9026
10	0.1889	0.887	0.008	301 49.0	20 7.3	281 5.5	18 44.4	1.04401	1.27495	8.02	0.9040
11	0.1917	0.894	+0.003	301 46.8	20 7.1	280 0.7	18 40.0	1.04522	1.27472	8.04	0.9053
12	0.1944	+0.901	−0.003	301 47.2	20 7.1	278 55.8	18 35.7	1.04544	1.27452	−8.06	−0.9065
13	0.1972	0.907	0.009	301 53.1	20 7.5	277 50.8	18 31.4	1.04485	1.27433	8.08	0.9075
14	0.1999	0.914	0.012	302 6.3	20 8.4	276 45.9	18 27.1	1.04389	1.27416	8.10	0.9084
15	0.2026	0.921	0.012	302 26.9	20 9.8	275 40.9	18 22.7	1.04312	1.27402	8.11	0.9092
16	0.2054	0.927	0.008	302 52.7	20 11.5	274 35.9	18 18.4	1.04295	1.27390	8.12	0.9098
17	0.2081	+0.934	−0.002	303 20.0	20 13.3	273 30.9	18 14.1	1.04366	1.27381	−8.13	−0.9103
18	0.2108	0.941	+0.005	303 45.2	20 15.0	272 25.9	18 9.7	1.04529	1.27374	8.14	0.9106
19	0.2136	0.947	0.012	304 5.2	20 16.3	271 20.9	18 5.4	1.04759	1.27370	8.14	0.9108
20	0.2163	0.954	0.016	304 18.4	20 17.2	270 15.9	18 1.1	1.05022	1.27368	8.15	0.9110
21	0.2191	0.961	0.018	304 25.1	20 17.7	269 11.1	17 56.7	1.05278	1.27368	8.14	0.9109
h (12.0) 22	0.2218	+0.968	+0.017	304 26.8	20 17.8	268 6.1	17 52.4	1.05491	1.27372	−8.14	−0.9108
23	0.2245	0.974	0.013	304 25.4	20 17.7	267 1.3	17 48.1	1.05641	1.27377	8.14	0.9105
24	0.2273	0.981	0.008	304 23.4	20 17.6	265 56.5	17 43.8	1.05719	1.27385	8.13	0.9100
25	0.2300	0.988	+0.001	304 23.1	20 17.5	264 51.8	17 39.5	1.05729	1.27396	8.12	0.9095
26	0.2328	0.994	−0.006	304 26.1	20 17.7	263 47.2	17 35.1	1.05685	1.27408	8.11	0.9088
27	0.2355	+1.001	−0.011	304 33.5	20 18.2	262 42.6	17 30.8	1.05603	1.27423	−8.09	−0.9080
28	0.2382	1.008	0.015	304 45.8	20 19.1	261 38.1	17 26.5	1.05508	1.27441	8.07	0.9070
29	0.2410	1.014	0.016	305 3.0	20 20.2	260 33.8	17 22.3	1.05426	1.27460	8.05	0.9060
30	0.2437	1.021	0.015	305 24.4	20 21.6	259 29.5	17 18.0	1.05385	1.27483	8.03	0.9048
31	0.2464	1.028	0.012	305 48.2	20 23.2	258 25.3	17 13.7	1.05407	1.27507	8.01	0.9034
Apr. 1	0.2492	+1.035	−0.006	306 12.5	20 24.8	257 21.2	17 9.4	1.05510	1.27533	−7.98	−0.9019
2	0.2519	+1.042	0.000	306 34.3	20 26.3	256 17.3	17 5.2	1.05687	1.27562	−7.95	−0.9003

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	*f*	*f'*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Apr. 1	0.2492	+1.035	−0.006	306 12.5	20 24.8	257 21.2	17 9.4	1.05510	1.27533	−7.98	−0.9019
2	0.2519	1.042	0.000	306 34.3	20 26.3	256 17.3	17 5.2	1.05687	1.27562	7.95	0.9003
3	0.2547	1.049	+0.006	306 51.4	20 27.4	255 13.5	17 0.9	1.05920	1.27593	7.92	0.8986
4	0.2574	1.056	0.009	307 2.8	20 28.2	254 9.8	16 56.7	1.06178	1.27626	7.88	0.8967
5	0.2601	1.063	0.010	307 8.0	20 28.5	253 6.3	16 52.4	1.06415	1.27660	7.85	0.8947
h (13.0) 6	0.2629	+1.070	+0.008	307 9.5	20 28.6	252 2.9	16 48.2	1.06595	1.27697	−7.81	−0.8926
7	0.2656	1.077	+0.004	307 9.7	20 28.6	250 59.6	16 44.0	1.06692	1.27736	7.77	0.8903
8	0.2683	1.084	−0.002	307 11.8	20 28.8	249 56.6	16 39.8	1.06693	1.27776	7.73	0.8879
9	0.2711	1.092	0.008	307 19.5	20 29.3	248 53.7	16 35.6	1.06618	1.27818	7.68	0.8853
10	0.2738	1.099	0.012	307 34.4	20 30.3	247 50.9	16 31.4	1.06507	1.27862	7.63	0.8826
11	0.2766	+1.106	−0.013	307 56.7	20 31.8	246 48.3	16 27.2	1.06409	1.27907	−7.58	−0.8797
12	0.2793	1.114	0.010	308 24.8	20 33.7	245 45.9	16 23.1	1.06363	1.27954	7.53	0.8768
13	0.2820	1.121	−0.005	308 54.9	20 35.7	244 43.6	16 18.9	1.06402	1.28003	7.48	0.8736
14	0.2848	1.129	+0.003	309 23.6	20 37.6	243 41.5	16 14.8	1.06534	1.28054	7.42	0.8703
15	0.2875	1.136	0.010	309 47.4	20 39.2	242 39.6	16 10.6	1.06735	1.28106	7.36	0.8669
16	0.2903	+1.144	+0.016	310 4.9	20 40.3	241 37.9	16 6.5	1.06975	1.28159	−7.30	−0.8633
17	0.2930	1.151	0.019	310 15.8	20 41.1	240 36.3	16 2.4	1.07211	1.28213	7.24	0.8595
18	0.2957	1.159	0.018	310 21.2	20 41.4	239 35.0	15 58.3	1.07409	1.28268	7.17	0.8556
19	0.2985	1.167	0.015	310 23.7	20 41.6	238 33.8	15 54.3	1.07549	1.28324	7.11	0.8516
20	0.3012	1.175	0.010	310 25.5	20 41.7	237 32.8	15 50.2	1.07621	1.28382	7.04	0.8473
h 21	0.3039	+1.183	+0.004	310 28.8	20 41.9	236 32.0	15 46.1	1.07630	1.28440	−6.97	−0.8429
(14.0) 22	0.3067	1.191	−0.003	310 35.4	20 42.4	235 31.4	15 42.1	1.07586	1.28498	6.89	0.8384
23	0.3094	1.199	0.009	310 46.2	20 43.1	234 31.0	15 38.1	1.07510	1.28558	6.82	0.8336
24	0.3122	1.206	0.013	311 1.9	20 44.1	233 30.7	15 34.1	1.07423	1.28620	6.74	0.8287
25	0.3149	1.214	0.015	311 22.3	20 45.5	232 30.7	15 30.1	1.07351	1.28682	6.66	0.8236
26	0.3176	+1.223	−0.015	311 46.7	20 47.1	231 30.9	15 26.1	1.07321	1.28743	−6.58	−0.8183
27	0.3204	1.231	0.012	312 13.4	20 48.9	230 31.3	15 22.1	1.07353	1.28805	6.50	0.8129
28	0.3231	1.240	0.008	312 40.3	20 50.7	229 31.9	15 18.1	1.07455	1.28867	6.42	0.8072
29	0.3258	1.249	−0.002	313 4.9	20 52.3	228 32.7	15 14.2	1.07631	1.28930	6.33	0.8013
30	0.3286	1.259	+0.004	313 25.1	20 53.7	227 33.7	15 10.3	1.07864	1.28993	6.24	0.7953
May 1	0.3313	+1.268	+0.008	313 39.6	20 54.6	226 34.9	15 6.3	1.08125	1.29056	−6.15	−0.7890
2	0.3341	1.277	0.010	313 48.4	20 55.2	225 36.3	15 2.4	1.08374	1.29119	6.06	0.7825
3	0.3368	1.286	0.009	313 52.7	20 55.5	224 37.9	14 58.5	1.08573	1.29183	5.97	0.7758
4	0.3395	1.295	+0.005	313 55.7	20 55.7	223 39.8	14 54.7	1.08696	1.29247	5.87	0.7688
5	0.3423	1.304	−0.001	314 0.4	20 56.0	222 41.8	14 50.8	1.08737	1.29310	5.78	0.7617
h 6	0.3450	+1.314	−0.008	314 10.2	20 56.7	221 44.0	14 46.9	1.08710	1.29373	−5.68	−0.7543
(15.0) 7	0.3478	1.323	0.013	314 26.9	20 57.8	220 46.4	14 43.1	1.08647	1.29435	5.58	0.7466
8	0.3505	1.332	0.015	314 50.5	20 59.4	219 49.0	14 39.3	1.08590	1.29497	5.48	0.7387
9	0.3532	1.342	0.013	315 19.9	21 1.3	218 51.8	14 35.5	1.08586	1.29559	5.38	0.7305
10	0.3560	1.352	0.008	315 52.0	21 3.5	217 54.8	14 31.7	1.08666	1.29621	5.27	0.7220
11	0.3587	+1.361	−0.001	316 22.8	21 5.5	216 58.0	14 27.9	1.08836	1.29682	−5.17	−0.7132
12	0.3614	1.371	+0.007	316 49.2	21 7.3	216 1.4	14 24.1	1.09078	1.29743	5.06	0.7042
13	0.3642	1.381	0.014	317 9.2	21 8.6	215 4.9	14 20.3	1.09357	1.29803	4.95	0.6948
14	0.3669	1.391	0.018	317 22.6	21 9.5	214 8.6	14 16.6	1.09636	1.29861	4.84	0.6851
15	0.3696	1.401	0.019	317 30.6	21 10.0	213 12.5	14 12.8	1.09883	1.29919	4.73	0.6750
16	0.3724	+1.411	+0.017	317 35.0	21 10.3	212 16.6	14 9.1	1.10074	1.29977	−4.62	−0.6646
17	0.3751	+1.421	+0.012	317 38.6	21 10.6	211 20.8	14 5.4	1.10199	1.30033	−4.51	−0.6538

FOR WASHINGTON MEAN MIDNIGHT.

Day. (Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
May 17	0.3751	+1.421	+0.012	317 38.6	21 10.6	211 20.8	14 5.4	1.10199	1.30033	−4.51	−0.6538
18	0.3779	1.431	+0.006	317 43.7	21 10.9	210 25.2	14 1.7	1.10263	1.30089	4.39	0.6426
19	0.3806	1.441	−0.001	317 51.8	21 11.5	209 29.7	13 58.0	1.10281	1.30143	4.28	0.6310
20	0.3833	1.452	0.007	318 4.0	21 12.3	208 34.4	13 54.3	1.10268	1.30196	4.16	0.6189
21	0.3861	1.462	0.012	318 20.5	21 13.4	207 39.2	13 50.6	1.10250	1.30248	4.04	0.6064
(h 16.0) 22	0.3888	+1.473	−0.014	318 41.5	21 14.8	206 44.2	13 46.9	1.10250	1.30300	−3.92	−0.5934
23	0.3916	1.484	0.015	319 5.5	21 16.4	205 49.4	13 43.3	1.10288	1.30350	3.80	0.5798
24	0.3943	1.494	0.013	319 31.6	21 18.1	204 54.7	13 39.6	1.10381	1.30399	3.68	0.5658
25	0.3970	1.505	0.008	319 57.7	21 19.8	204 0.1	13 36.0	1.10542	1.30447	3.56	0.5511
26	0.3998	1.516	−0.003	320 21.4	21 21.4	203 5.7	13 32.4	1.10770	1.30493	3.43	0.5358
27	0.4025	+1.526	+0.003	320 40.9	21 22.7	202 11.3	13 28.8	1.11048	1.30537	−3.31	−0.5197
28	0.4052	1.537	0.008	320 54.9	21 23.7	201 17.2	13 25.1	1.11353	1.30580	3.18	0.5030
29	0.4080	1.548	0.011	321 3.3	21 24.2	200 23.1	13 21.5	1.11648	1.30622	3.06	0.4855
30	0.4107	1.559	0.010	321 7.3	21 24.5	199 29.2	13 18.0	1.11900	1.30662	2.93	0.4671
31	0.4135	1.571	0.007	321 9.5	21 24.6	198 35.4	13 14.4	1.12086	1.30701	2.80	0.4478
June 1	0.4162	+1.582	+0.001	321 12.9	21 24.9	197 41.7	13 10.8	1.12196	1.30738	−2.68	−0.4274
2	0.4189	1.593	−0.006	321 20.4	21 25.4	196 48.1	13 7.2	1.12241	1.30772	2.55	0.4060
3	0.4217	1.604	0.012	321 34.0	21 26.3	195 54.7	13 3.6	1.12251	1.30806	2.42	0.3833
4	0.4244	1.616	0.015	321 54.3	21 27.6	195 1.3	13 0.1	1.12270	1.30839	2.29	0.3592
5	0.4272	1.627	0.015	322 20.0	21 29.3	194 8.0	12 56.5	1.12334	1.30870	2.16	0.3336
(h 17.0) 6	0.4299	+1.639	−0.011	322 48.2	21 31.2	193 14.8	12 53.0	1.12471	1.30898	−2.02	−0.3064
7	0.4326	1.650	−0.004	323 15.4	21 33.0	192 21.7	12 49.4	1.12691	1.30925	1.89	0.2771
8	0.4354	1.661	+0.004	323 38.7	21 34.6	191 28.7	12 45.9	1.12979	1.30950	1.76	0.2456
9	0.4381	1.673	0.011	323 56.0	21 35.7	190 35.7	12 42.4	1.13305	1.30974	1.63	0.2115
10	0.4408	1.684	0.016	324 7.1	21 36.5	189 42.8	12 38.9	1.13635	1.30996	1.49	0.1744
11	0.4436	+1.696	+0.018	324 12.8	21 36.9	188 49.9	12 35.3	1.13933	1.31016	−1.36	−0.1336
12	0.4463	1.707	0.018	324 15.1	21 37.0	187 57.1	12 31.8	1.14179	1.31034	1.23	0.0886
13	0.4490	1.719	0.014	324 16.4	21 37.1	187 4.4	12 28.3	1.14365	1.31050	1.09	0.0382
14	0.4518	1.731	0.008	324 18.6	21 37.2	186 11.7	12 24.8	1.14490	1.31064	0.96	9.9810
15	0.4545	1.742	+0.001	324 23.7	21 37.6	185 19.0	12 21.3	1.14569	1.31076	0.82	9.9150
16	0.4573	+1.754	−0.005	324 32.2	21 38.2	184 26.4	12 17.8	1.14622	1.31087	−0.69	−9.8370
17	0.4600	1.766	0.010	324 44.6	21 39.0	183 33.8	12 14.3	1.14670	1.31096	0.55	9.7417
18	0.4627	1.777	0.014	325 0.7	21 40.0	182 41.2	12 10.7	1.14729	1.31103	0.42	9.6193
19	0.4655	1.789	0.015	325 19.9	21 41.3	181 48.6	12 7.2	1.14824	1.31108	0.28	9.4481
20	0.4682	1.801	0.013	325 40.5	21 42.7	180 56.1	12 3.7	1.14967	1.31111	0.14	9.1612
(h 18.0) 21	0.4710	+1.812	−0.010	326 0.7	21 44.0	180 3.6	12 0.2	1.15165	1.31112	−0.01	−7.9674
22	0.4737	1.824	−0.004	326 19.3	21 45.3	179 11.1	11 56.7	1.15419	1.31111	+0.13	+9.1018
23	0.4764	1.836	+0.002	326 33.9	21 46.3	178 18.5	11 53.2	1.15718	1.31108	0.26	9.4184
24	0.4792	1.848	0.007	326 43.6	21 46.9	177 26.0	11 49.7	1.16041	1.31104	0.40	9.5994
25	0.4819	1.859	0.011	326 48.4	21 47.2	176 33.5	11 46.2	1.16357	1.31098	0.53	9.7267
26	0.4846	+1.871	+0.012	326 48.9	21 47.3	175 40.9	11 42.7	1.16638	1.31089	+0.67	+9.8249
27	0.4874	1.883	0.009	326 47.2	21 47.1	174 48.4	11 39.2	1.16860	1.31079	0.80	9.9049
28	0.4901	1.894	+0.004	326 46.2	21 47.1	173 55.8	11 35.7	1.17014	1.31066	0.94	9.9722
29	0.4928	1.906	−0.003	326 48.3	21 47.2	173 3.1	11 32.2	1.17109	1.31052	1.07	0.0304
30	0.4956	1.918	0.009	326 55.4	21 47.7	172 10.5	11 28.7	1.17166	1.31036	1.21	0.0816
July 1	0.4983	+1.929	−0.014	327 8.6	21 48.6	171 17.8	11 25.2	1.17218	1.31019	+1.34	+0.1273
2	0.5011	+1.941	−0.015	327 26.6	21 49.8	170 25.1	11 21.7	1.17305	1.30999	+1.47	+0.1686

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G	G	H	H	Log g.	Log k.	i	Log
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
July 1	0.4983	+1.929	−0.014	327 8.6	21 48.6	171 17.8	11 25.2	1.17218	1.31019	+1.34	+0.12
2	0.5011	1.941	0.015	327 26.6	21 49.8	170 25.1	11 21.7	1.17305	1.30999	1.47	0.16
3	0.5038	1.952	0.013	327 47.4	21 51.2	169 32.3	11 18.2	1.17456	1.30978	1.61	0.20
4	0.5065	1.964	−0.007	328 7.8	21 52.5	168 39.5	11 14.6	1.17675	1.30955	1.74	0.24
5	0.5093	1.975	+0.001	328 25.1	21 53.7	167 46.6	11 11.1	1.17957	1.30930	1.87	0.27
h 6	0.5120	+1.986	+0.008	328 37.3	21 54.5	166 53.7	11 7.6	1.18279	1.30903	+2.00	+0.30
(19.0) 7	0.5148	1.998	0.014	328 43.9	21 54.9	166 0.7	11 4.0	1.18607	1.30874	2.13	0.32
8	0.5175	2.009	0.018	328 45.4	21 55.0	165 7.6	11 0.5	1.18911	1.30844	2.27	0.35
9	0.5202	2.021	0.018	328 43.6	21 54.9	164 14.5	10 57.0	1.19167	1.30812	2.40	0.37
10	0.5230	2.032	0.015	328 40.6	21 54.7	163 21.3	10 53.4	1.19366	1.30779	2.52	0.40
11	0.5257	+2.043	+0.009	328 38.3	21 54.6	162 27.9	10 49.9	1.19512	1.30744	+2.65	+0.42
12	0.5284	2.054	+0.003	328 38.2	21 54.6	161 34.5	10 46.3	1.19613	1.30707	2.78	0.44
13	0.5312	2.065	−0.003	328 41.3	21 54.8	160 41.0	10 42.7	1.19684	1.30669	2.91	0.46
14	0.5339	2.076	0.009	328 48.1	21 55.2	159 47.3	10 39.2	1.19745	1.30630	3.03	0.48
15	0.5367	2.087	0.013	328 58.1	21 55.9	158 53.6	10 35.6	1.19816	1.30588	3.16	0.49
16	0.5394	+2.098	−0.015	329 10.6	21 56.7	157 59.8	10 32.0	1.19913	1.30545	+3.28	+0.51
17	0.5421	2.109	0.014	329 24.6	21 57.6	157 5.8	10 28.4	1.20046	1.30501	3.41	0.53
18	0.5449	2.120	0.011	329 38.6	21 58.6	156 11.7	10 24.8	1.20227	1.30456	3.53	0.54
19	0.5476	2.130	−0.006	329 51.3	21 59.4	155 17.5	10 21.2	1.20457	1.30409	3.65	0.56
20	0.5504	2.141	0.000	330 0.9	22 0.1	154 23.1	10 17.5	1.20726	1.30360	3.77	0.57
h 21	0.5531	+2.152	+0.006	330 6.5	22 0.4	153 28.6	10 13.9	1.21018	1.30311	+3.89	+0.59
(20.0) 22	0.5558	2.162	0.010	330 7.7	22 0.5	152 34.0	10 10.3	1.21309	1.30261	4.01	0.60
23	0.5586	2.172	0.012	330 5.0	22 0.3	151 39.3	10 6.6	1.21575	1.30210	4.13	0.61
24	0.5613	2.183	0.011	330 0.1	22 0.0	150 44.4	10 3.0	1.21792	1.30157	4.25	0.62
25	0.5640	2.193	+0.006	329 55.1	21 59.7	149 49.3	9 59.3	1.21947	1.30103	4.36	0.63
26	0.5668	+2.203	0.000	329 52.4	21 59.5	148 54.1	9 55.6	1.22043	1.30048	+4.48	+0.65
27	0.5695	2.213	−0.006	329 54.0	21 59.6	147 58.8	9 51.9	1.22101	1.29993	4.59	0.661
28	0.5722	2.224	0.012	330 0.7	22 0.0	147 3.3	9 48.2	1.22145	1.29936	4.70	0.672
29	0.5750	2.234	0.015	330 12.1	22 0.8	146 7.7	9 44.5	1.22210	1.29878	4.81	0.682
30	0.5777	2.244	0.013	330 26.7	22 1.8	145 11.9	9 40.8	1.22322	1.29820	4.92	0.691
31	0.5805	+2.253	−0.009	330 41.5	22 2.8	144 15.9	9 37.1	1.22492	1.29761	+5.03	+0.701
Aug. 1	0.5832	2.263	−0.002	330 54.4	22 3.6	143 19.8	9 33.3	1.22722	1.29702	5.13	0.710
2	0.5859	2.273	+0.006	331 3.1	22 4.2	142 23.5	9 29.6	1.22993	1.29641	5.24	0.719
3	0.5887	2.282	0.012	331 6.7	22 4.4	141 27.1	9 25.8	1.23276	1.29580	5.34	0.727
4	0.5914	2.292	0.017	331 5.7	22 4.4	140 30.5	9 22.0	1.23540	1.29518	5.44	0.735
h 5	0.5942	+2.301	+0.018	331 1.4	22 4.1	139 33.6	9 18.2	1.23765	1.29457	+5.54	+0.743
(21.0) 6	0.5969	2.311	0.015	330 55.5	22 3.7	138 36.6	9 14.4	1.23942	1.29395	5.64	0.751
7	0.5996	2.320	0.011	330 50.1	22 3.3	137 39.5	9 10.6	1.24067	1.29333	5.74	0.759
8	0.6024	2.329	+0.005	330 46.6	22 3.1	136 42.2	9 6.8	1.24148	1.29270	5.84	0.766
9	0.6051	2.338	−0.002	330 46.1	22 3.1	135 44.6	9 3.0	1.24198	1.29208	5.93	0.773
10	0.6078	+2.347	−0.008	330 48.7	22 3.2	134 46.9	8 59.1	1.24235	1.29146	+6.02	+0.779
11	0.6106	2.356	0.012	330 54.5	22 3.6	133 49.0	8 55.3	1.24277	1.29083	6.11	0.786
12	0.6133	2.365	0.015	331 2.9	22 4.2	132 50.9	8 51.4	1.24338	1.29021	6.20	0.792
13	0.6161	2.374	0.015	331 12.9	22 4.9	131 52.5	8 47.5	1.24428	1.28957	6.29	0.798
14	0.6188	2.382	0.013	331 23.2	22 5.5	130 54.0	8 43.6	1.24555	1.28894	6.38	0.8047
15	0.6215	+2.391	−0.008	331 32.7	22 6.2	129 55.4	8 39.7	1.24728	1.28833	+6.46	+0.8103
16	0.6243	+2.400	−0.003	331 39.9	22 6.7	128 56.5	8 35.8	1.24937	1.28771	+6.54	+0.8158

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	r	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Aug. 16	0.6243	+2.400	−0.003	331 39.9	22 6.7	128 56.5	8 35.8	1.24937	1.28771	+6.54	+0.8158
17	0.6270	2.408	+0.003	331 43.8	22 6.9	127 57.4	8 31.8	1.25169	1.28709	6.62	0.8212
18	0.6298	2.416	0.008	331 43.9	22 6.9	126 58.2	8 27.9	1.25409	1.28649	6.70	0.8263
19	0.6325	2.424	0.011	331 40.5	22 6.7	125 58.7	8 23.9	1.25631	1.28588	6.78	0.8312
h 20	0.6352	2.433	0.011	331 34.7	22 6.3	124 59.0	8 19.9	1.25813	1.28529	6.86	0.8360
(22.0) 21	0.6380	+2.441	+0.008	331 28.4	22 5.9	123 59.2	8 15.9	1.25945	1.28470	+6.93	+0.8406
22	0.6407	2.449	+0.002	331 23.7	22 5.6	122 59.2	8 11.9	1.26022	1.28412	7.00	0.8450
23	0.6434	2.456	−0.004	331 22.5	22 5.5	121 59.0	8 7.9	1.26057	1.28355	7.07	0.8493
24	0.6462	2.464	0.010	331 26.0	22 5.7	120 58.6	8 3.9	1.26071	1.28299	7.14	0.8534
25	0.6489	2.472	0.013	331 34.3	22 6.3	119 58.0	7 59.9	1.26095	1.28243	7.20	0.8574
26	0.6516	+2.480	−0.013	331 45.9	22 7.1	118 57.3	7 55.8	1.26154	1.28189	+7.27	+0.8612
27	0.6544	2.488	0.009	331 58.5	22 7.9	117 56.4	7 51.8	1.26263	1.28136	7.33	0.8648
28	0.6571	2.495	−0.003	332 10.1	22 8.7	116 55.4	7 47.7	1.26428	1.28085	7.38	0.8683
29	0.6599	2.503	+0.004	332 18.4	22 9.2	115 54.1	7 43.6	1.26635	1.28035	7.44	0.8716
30	0.6626	2.510	0.011	332 22.2	22 9.5	114 52.7	7 39.5	1.26858	1.27986	7.49	0.8748
31	0.6653	+2.518	+0.016	332 21.5	22 9.4	113 51.2	7 35.4	1.27073	1.27938	+7.55	+0.8779
Sept. 1	0.6681	2.525	0.018	332 17.6	22 9.2	112 49.4	7 31.3	1.27259	1.27892	7.60	0.8808
2	0.6708	2.532	0.017	332 11.8	22 8.8	111 47.5	7 27.2	1.27398	1.27847	7.65	0.8835
3	0.6736	2.540	0.013	332 6.2	22 8.4	110 45.5	7 23.0	1.27492	1.27804	7.70	0.8862
4	0.6763	2.547	+0.007	332 2.0	22 8.1	109 43.3	7 18.9	1.27541	1.27763	7.74	0.8886
h 5	0.6790	+2.554	0.000	332 0.3	22 8.0	108 41.0	7 14.7	1.27560	1.27724	+7.78	+0.8910
(23.0) 6	0.6818	2.561	−0.006	332 2.0	22 8.2	107 38.5	7 10.6	1.27562	1.27686	7.82	0.8932
7	0.6845	2.568	0.011	332 7.0	22 8.5	106 35.9	7 6.4	1.27565	1.27651	7.86	0.8953
8	0.6872	2.575	0.014	332 14.5	22 9.0	105 33.2	7 2.2	1.27580	1.27616	7.89	0.8972
9	0.6900	2.582	0.015	332 23.7	22 9.6	104 30.3	6 58.0	1.27622	1.27584	7.92	0.8990
10	0.6927	+2.589	−0.014	332 33.6	22 10.2	103 27.3	6 53.8	1.27697	1.27555	+7.96	+0.9007
11	0.6955	2.596	0.010	332 43.1	22 10.9	102 24.1	6 49.6	1.27811	1.27527	7.99	0.9023
12	0.6982	2.603	−0.005	332 51.0	22 11.4	101 20.9	6 45.4	1.27962	1.27502	8.01	0.9037
13	0.7009	2.609	+0.001	332 56.1	22 11.7	100 17.5	6 41.2	1.28138	1.27477	8.04	0.9050
14	0.7037	2.616	0.006	332 57.8	22 11.9	99 14.1	6 36.9	1.28325	1.27456	8.06	0.9062
15	0.7064	+2.623	+0.009	332 56.1	22 11.7	98 10.5	6 32.7	1.28503	1.27437	+8.08	+0.9072
16	0.7092	2.630	0.010	332 52.1	22 11.5	97 6.9	6 28.5	1.28653	1.27421	8.09	0.9081
17	0.7119	2.636	0.008	332 47.2	22 11.1	96 3.1	6 24.2	1.28759	1.27406	8.11	0.9089
18	0.7146	2.643	+0.003	332 43.3	22 10.9	94 59.3	6 20.0	1.28816	1.27394	8.12	0.9096
19	0.7174	2.650	−0.003	332 42.4	22 10.8	93 55.5	6 15.7	1.28829	1.27384	8.13	0.9101
h 20	0.7201	+2.656	−0.009	332 45.8	22 11.1	92 51.5	6 11.4	1.28819	1.27376	+8.14	+0.9105
(0.0) 21	0.7228	2.663	0.013	332 53.7	22 11.6	91 47.5	6 7.2	1.28813	1.27371	8.14	0.9108
22	0.7256	2.669	0.013	333 5.5	22 12.4	90 43.5	6 2.9	1.28833	1.27369	8.14	0.9109
23	0.7283	2.676	0.011	333 19.1	22 13.3	89 39.5	5 58.6	1.28898	1.27368	8.14	0.9109
24	0.7311	2.683	−0.005	333 32.3	22 14.1	88 35.4	5 54.4	1.29016	1.27370	8.14	0.9108
25	0.7338	+2.689	+0.003	333 42.9	22 14.9	87 31.2	5 50.1	1.29178	1.27375	+8.14	+0.9106
26	0.7365	2.696	0.010	333 49.6	22 15.3	86 27.0	5 45.8	1.29362	1.27381	8.13	0.9102
27	0.7393	2.703	0.016	333 51.9	22 15.5	85 22.8	5 41.5	1.29546	1.27389	8.12	0.9098
28	0.7420	2.709	0.019	333 50.7	22 15.4	84 18.6	5 37.2	1.29707	1.27401	8.11	0.9091
29	0.7448	2.716	0.018	333 47.4	22 15.2	83 14.6	5 33.0	1.29828	1.27416	8.10	0.9084
30	0.7475	+2.723	+0.015	333 43.7	22 14.9	82 10.5	5 28.7	1.29904	1.27432	+8.08	+0.9075
Oct. 1	0.7502	+2.729	+0.009	333 41.4	22 14.8	81 6.4	5 24.4	1.29936	1.27450	+8.06	+0.9065

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7502	+2.729	+0.009	333 41.4	22 14.8	81 6.4	5 24.4	1.29936	1.27450	+8.06	+0.9
	2	0.7530	2.736	+0.003	333 41.4	22 14.8	80 2.3	5 20.2	1.29936	1.27470	8.04	0.9
	3	0.7557	2.743	−0.004	333 44.6	22 15.0	78 58.2	5 15.9	1.29921	1.27494	8.02	0.9
	4	0.7584	2.750	0.009	333 50.8	22 15.4	77 54.2	5 11.6	1.29903	1.27519	7.99	0.9
h	5	0.7612	2.756	0.013	333 59.6	22 16.0	76 50.2	5 7.3	1.29896	1.27547	7.96	0.9
(1.0)	6	0.7639	+2.763	−0.015	334 10.4	22 16.7	75 46.3	5 3.1	1.29914	1.27577	+7.93	+0.8
	7	0.7666	2.770	0.014	334 22.2	22 17.5	74 42.4	4 58.8	1.29964	1.27609	7.90	0.8
	8	0.7694	2.777	0.011	334 33.7	22 18.2	73 38.6	4 54.6	1.30049	1.27642	7.87	0.8
	9	0.7721	2.784	0.006	334 44.0	22 18.9	72 34.9	4 50.3	1.30169	1.27678	7.83	0.8
	10	0.7748	2.791	−0.001	334 51.9	22 19.5	71 31.1	4 46.1	1.30317	1.27717	7.79	0.8
	11	0.7776	+2.798	+0.004	334 56.8	22 19.8	70 27.5	4 41.8	1.30480	1.27757	+7.75	+0.88
	12	0.7803	2.805	0.008	334 58.5	22 19.9	69 23.9	4 37.6	1.30639	1.27798	7.70	0.88
	13	0.7831	2.812	0.010	334 57.6	22 19.8	68 20.5	4 33.4	1.30777	1.27842	7.65	0.88
	14	0.7858	2.820	0.008	334 55.5	22 19.7	67 17.1	4 29.1	1.30880	1.27887	7.60	0.88
	15	0.7885	2.827	+0.004	334 53.9	22 19.6	66 13.8	4 24.9	1.30939	1.27934	7.55	0.87
	16	0.7913	+2.835	−0.002	334 54.7	22 19.6	65 10.6	4 20.7	1.30956	1.27983	+7.50	+0.87
	17	0.7940	2.842	0.008	334 59.4	22 20.0	64 7.6	4 16.5	1.30948	1.28033	7.44	0.87
	18	0.7968	2.850	0.013	335 8.5	22 20.6	63 4.6	4 12.3	1.30939	1.28084	7.38	0.86
	19	0.7995	2.857	0.015	335 21.6	22 21.5	62 1.7	4 8.1	1.30952	1.28138	7.32	0.86
h	20	0.8022	2.865	0.013	335 37.1	22 22.5	60 59.0	4 3.9	1.31007	1.28193	7.26	0.86
(2.0)	21	0.8050	+2.873	−0.007	335 52.7	22 23.5	59 56.4	3 59.8	1.31115	1.28248	+7.20	+0.85
	22	0.8077	2.881	0.000	336 6.4	22 24.4	58 54.0	3 55.6	1.31268	1.28305	7.13	0.85
	23	0.8104	2.889	+0.008	336 16.5	22 25.1	57 51.7	3 51.4	1.31451	1.28363	7.06	0.84
	24	0.8132	2.897	0.015	336 22.4	22 25.5	56 49.5	3 47.3	1.31638	1.28423	6.99	0.84
	25	0.8159	2.905	0.019	336 24.5	22 25.6	55 47.4	3 43.2	1.31808	1.28483	6.91	0.83
	26	0.8187	+2.913	+0.019	336 24.2	22 25.6	54 45.5	3 39.0	1.31943	1.28544	+6.84	+0.83
	27	0.8214	2.921	0.017	336 23.0	22 25.5	53 43.7	3 34.9	1.32035	1.28606	6.76	0.82
	28	0.8241	2.929	0.011	336 22.8	22 25.5	52 42.1	3 30.8	1.32084	1.28668	6.68	0.82
	29	0.8269	2.937	+0.005	336 24.7	22 25.6	51 40.6	3 26.7	1.32103	1.28732	6.60	0.819
	30	0.8296	2.946	−0.001	336 29.4	22 26.0	50 39.3	3 22.6	1.32103	1.28797	6.50	0.813
	31	0.8324	+2.954	−0.007	336 37.1	22 26.5	49 38.1	3 18.5	1.32099	1.28861	+6.42	+0.807
Nov.	1	0.8351	2.963	0.012	336 47.5	22 27.2	48 37.2	3 14.5	1.32106	1.28925	6.34	0.801
	2	0.8378	2.972	0.014	336 59.8	22 28.0	47 36.3	3 10.4	1.32138	1.28990	6.24	0.795
	3	0.8406	2.981	0.014	337 13.1	22 28.9	46 35.6	3 6.4	1.32199	1.29056	6.15	0.789
h	4	0.8433	2.990	0.011	337 26.3	22 29.8	45 35.1	3 2.3	1.32293	1.29121	6.06	0.782
(8.0)	5	0.8460	+2.999	−0.008	337 38.5	22 30.6	44 34.7	2 58.3	1.32424	1.29187	+5.96	+0.775
	6	0.8488	3.008	−0.002	337 48.4	22 31.2	43 34.4	2 54.3	1.32581	1.29253	5.86	0.768
	7	0.8515	3.018	+0.003	337 55.4	22 31.7	42 34.3	2 50.3	1.32754	1.29318	5.76	0.760
	8	0.8543	3.027	0.007	337 59.4	22 32.0	41 34.3	2 46.3	1.32929	1.29382	5.66	0.753
	9	0.8570	3.036	0.009	338 0.7	22 32.0	40 34.5	2 42.3	1.33085	1.29448	5.56	0.745
	10	0.8597	+3.046	+0.009	338 0.4	22 32.0	39 34.9	2 38.3	1.33211	1.29514	+5.45	+0.736
	11	0.8625	3.055	+0.005	338 0.1	22 32.0	38 35.4	2 34.4	1.33298	1.29578	5.35	0.728
	12	0.8652	3.065	−0.001	338 1.5	22 32.1	37 36.0	2 30.4	1.33347	1.29642	5.24	0.719
	13	0.8680	3.075	0.007	338 6.3	22 32.4	36 36.7	2 26.4	1.33370	1.29705	5.13	0.709
	14	0.8707	3.085	0.013	338 15.3	22 33.0	35 37.6	2 22.5	1.33389	1.29768	5.01	0.700
	15	0.8734	+3.095	−0.015	338 28.1	22 33.9	34 38.7	2 18.6	1.33426	1.29830	+4.90	+0.690
	16	0.8762	+3.105	−0.015	338 43.3	22 34.9	33 39.9	2 14.7	1.33500	1.29891	+4.79	+0.680

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Nov. 16	0.8762	+3.105	−0.015	338 43.3	22 34.9	33 39.9	2 14.7	1.33500	1.29891	+4.79	+0.6800
17	0.8789	3.116	0.011	338 59.3	22 36.0	32 41.2	2 10.7	1.33625	1.29952	4.67	0.6692
18	0.8816	3.126	−0.004	339 13.8	22 36.9	31 42.6	2 6.8	1.33797	1.30011	4.55	0.6581
19	0.8844	3.136	+0.004	339 25.1	22 37.7	30 44.3	2 3.0	1.34002	1.30070	4.43	0.6465
h 20	0.8871	3.147	0.012	339 32.3	22 38.2	29 46.0	1 59.1	1.34218	1.30127	4.31	0.6344
(4.0) 21	0.8898	+3.158	+0.017	339 35.7	22 38.4	28 47.9	1 55.2	1.34421	1.30183	+4.19	+0.6219
22	0.8926	3.168	0.020	339 36.3	22 38.4	27 49.9	1 51.3	1.34595	1.30239	4.06	0.6088
23	0.8953	3.179	0.018	339 35.8	22 38.4	26 52.0	1 47.5	1.34728	1.30293	3.94	0.5952
24	0.8981	3.190	0.014	339 35.6	22 38.4	25 54.2	1 43.6	1.34818	1.30345	3.81	0.5811
25	0.9008	3.201	0.008	339 37.2	22 38.5	24 56.6	1 39.8	1.34875	1.30397	3.68	0.5663
26	0.9035	+3.212	+0.001	339 41.3	22 38.8	23 59.1	1 35.9	1.34914	1.30447	+3.55	+0.5508
27	0.9063	3.223	−0.005	339 48.2	22 39.2	23 1.7	1 32.1	1.34948	1.30495	3.42	0.5346
28	0.9090	3.234	0.010	339 57.5	22 39.8	22 4.4	1 28.3	1.34989	1.30542	3.29	0.5176
29	0.9118	3.245	0.013	340 8.7	22 40.6	21 7.2	1 24.5	1.35051	1.30588	3.16	0.4999
30	0.9145	3.256	0.013	340 20.8	22 41.4	20 10.2	1 20.7	1.35141	1.30632	3.03	0.4812
Dec. 1	0.9172	+3.268	−0.011	340 33.0	22 42.2	19 13.2	1 16.9	1.35262	1.30674	+2.89	+0.4615
2	0.9200	3.279	0.008	340 44.0	22 42.9	18 16.3	1 13.1	1.35413	1.30714	2.76	0.4407
3	0.9227	3.290	−0.003	340 53.1	22 43.5	17 19.5	1 9.3	1.35592	1.30752	2.62	0.4187
4	0.9254	3.302	+0.003	340 59.5	22 44.0	16 22.8	1 5.5	1.35787	1.30789	2.49	0.3954
h 5	0.9282	3.314	0.007	341 3.1	22 44.2	15 26.1	1 1.7	1.35985	1.30824	2.35	0.3706
(5.0) 6	0.9309	+3.325	+0.010	341 3.9	22 44.3	14 29.5	0 58.0	1.36169	1.30858	+2.21	+0.3442
7	0.9337	3.337	0.010	341 2.8	22 44.2	13 33.0	0 54.2	1.36329	1.30889	2.07	0.3159
8	0.9364	3.349	0.007	341 1.3	22 44.1	12 36.5	0 50.4	1.36452	1.30918	1.93	0.2855
9	0.9391	3.361	+0.002	341 1.0	22 44.1	11 40.1	0 46.7	1.36535	1.30945	1.79	0.2526
10	0.9419	3.373	−0.005	341 3.2	22 44.2	10 43.8	0 42.9	1.36592	1.30971	1.65	0.2169
11	0.9446	+3.385	−0.011	341 9.1	22 44.6	9 47.5	0 39.2	1.36639	1.30994	+1.51	+0.1778
12	0.9474	3.397	0.016	341 18.6	22 45.2	8 51.2	0 35.4	1.36698	1.31015	1.36	0.1347
13	0.9501	3.409	0.016	341 30.7	22 46.0	7 55.0	0 31.7	1.36790	1.31034	1.22	0.0866
14	0.9528	3.421	0.014	341 43.8	22 46.9	6 58.8	0 27.9	1.36926	1.31051	1.08	0.0324
15	0.9556	3.433	−0.007	341 55.9	22 47.7	6 2.6	0 24.2	1.37107	1.31066	0.94	9.9703
16	0.9583	+3.445	+0.001	342 5.3	22 48.3	5 6.4	0 20.4	1.37321	1.31079	+0.79	+9.8976
17	0.9610	3.457	0.009	342 11.1	22 48.7	4 10.3	0 16.7	1.37551	1.31090	0.65	9.8100
18	0.9638	3.469	0.015	342 13.1	22 48.9	3 14.2	0 13.0	1.37776	1.31098	0.50	9.7000
19	0.9665	3.481	0.019	342 12.2	22 48.8	2 18.1	0 9.2	1.37975	1.31105	0.36	9.5522
h 20	0.9692	3.493	0.019	342 9.7	22 48.6	1 22.0	0 5.5	1.38136	1.31109	0.21	9.3260
(6.0) 21	0.9720	+3.505	+0.015	342 7.2	22 48.5	0 26.0	0 1.7	1.38256	1.31111	+0.07	+8.8263
22	0.9747	3.518	0.010	342 6.1	22 48.4	359 29.9	23 58.0	1.38344	1.31112	−0.08	−8.8911
23	0.9775	3.530	+0.003	342 7.2	22 48.5	358 33.8	23 54.3	1.38408	1.31110	0.22	9.3476
24	0.9802	3.542	−0.003	342 10.8	22 48.7	357 37.7	23 50.5	1.38462	1.31105	0.37	9.5652
25	0.9829	3.554	0.008	342 16.7	22 49.1	356 41.5	23 46.8	1.38522	1.31098	0.51	9.7093
26	0.9857	+3.566	−0.012	342 24.5	22 49.7	355 45.4	23 43.0	1.38598	1.31090	−0.66	−9.8173
27	0.9884	3.579	0.013	342 33.2	22 50.2	354 49.3	23 39.3	1.38696	1.31079	0.80	9.9036
28	0.9912	3.591	0.012	342 41.9	22 50.8	353 53.1	23 35.5	1.38822	1.31066	0.94	9.9754
29	0.9939	3.603	0.008	342 49.8	22 51.3	352 56.9	23 31.8	1.38977	1.31050	1.09	0.0369
30	0.9966	3.615	−0.004	342 56.1	22 51.7	352 0.6	23 28.0	1.39154	1.31033	1.23	0.0906
31	0.9994	+3.627	+0.001	343 0.1	22 52.0	351 4.3	23 24.3	1.39346	1.31013	−1.38	−0.1383
32	1.0021	+3.639	+0.006	343 1.3	22 52.1	350 7.9	23 20.5	1.39545	1.30992	−1.52	−0.1812

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A_1.	Log B_1.	Log C.	Log D.	f	G_1	H	Log g_1.	Log h.	Log i.
					s	° ′	° ′			
Jan. 0.72	+8.8852	−0.9251	−0.5217	+1.3042	+0.237	280 22	350 38	0.9322	1.3100	−0.1590
10.69	9.0617	0.9293	0.8152	1.2831	0.355	285 13	341 12	0.9448	1.3069	0.4524
20.67	9.1809	0.9360	0.9793	1.2464	0.467	289 24	331 36	0.9614	1.3021	0.6166
30.64	9.2679	0.9443	1.0876	1.1912	0.570	292 54	321 46	0.9799	1.2960	0.7249
Feb. 9.61	9.3340	0.9529	1.1627	1.1122	0.664	295 44	311 41	0.9983	1.2894	0.8000
19.58	+9.3859	−0.9606	−1.2148	+0.9990	+0.748	298 5	301 19	1.0150	1.2832	−0.8520
Mar. 1.56	9.4279	0.9664	1.2490	0.8269	0.823	300 7	290 44	1.0294	1.2780	0.8863
11.53	9.4634	0.9697	1.2681	+0.5135	0.894	302 0	279 59	1.0412	1.2747	0.9054
21.50	9.4948	0.9700	1.2736	−9.4287	0.961	303 52	269 11	1.0507	1.2737	0.9109
31.48	9.5242	0.9672	1.2662	0.5767	1.028	305 52	258 27	1.0585	1.2751	0.9034
Apr. 10.45	+9.5530	−0.9616	−1.2455	−0.8540	+1.099	308 2	247 54	1.0653	1.2786	−0.8827
20.42	9.5821	0.9536	1.2104	1.0125	1.175	310 26	237 38	1.0722	1.2838	0.8477
30.39	9.6120	0.9440	1.1586	1.1182	1.258	313 1	227 40	1.0801	1.2899	0.7959
May 10.37	9.6426	0.9337	1.0858	1.1924	1.351	315 44	218 2	1.0898	1.2961	0.7231
20.34	9.6737	0.9236	0.9836	1.2449	1.450	318 26	208 43	1.1018	1.3019	0.6209
30.31	+9.7048	−0.9148	−0.8333	−1.2805	+1.557	321 1	199 39	1.1162	1.3066	−0.4706
June 9.28	9.7351	0.9082	0.5818	1.3020	1.671	323 23	190 47	1.1326	1.3097	0.2190
19.26	9.7642	0.9043	−9.8590	1.3108	1.786	325 27	182 1	1.1505	1.3111	−9.4960
29.23	9.7916	0.9035	+0.3782	1.3076	1.903	327 10	173 17	1.1693	1.3106	+0.0156
July 9.20	9.8170	0.9058	0.7350	1.2921	2.018	328 32	164 30	1.1881	1.3082	0.3724
19.18	+9.8400	−0.9106	+0.9206	−1.2636	+2.127	329 35	155 35	1.2063	1.3042	+0.5579
29.15	9.8606	0.9172	1.0414	1.2199	2.231	330 23	146 27	1.2234	1.2990	0.6787
Aug. 8.12	9.8788	0.9247	1.1262	1.1575	2.326	331 0	137 4	1.2390	1.2929	0.7635
18.09	9.8948	0.9320	1.1870	1.0699	2.413	331 28	127 22	1.2530	1.2867	0.8242
28.07	9.9089	0.9383	1.2296	0.9435	2.492	331 54	117 22	1.2653	1.2811	0.8668
Sept. 7.04	+9.9213	−0.9426	+1.2571	−0.7446	+2.565	332 21	107 5	1.2760	1.2767	+0.8944
17.01	9.9327	0.9444	1.2713	−0.3327	2.633	332 52	96 34	1.2854	1.2741	0.9085
26.98	9.9435	0.9431	1.2728	+0.1247	2.699	333 31	85 56	1.2937	1.2738	0.9100
Oct. 6.96	9.9542	0.9386	1.2614	0.6808	2.766	334 18	75 17	1.3015	1.2759	0.8987
16.93	9.9653	0.9310	1.2364	0.9104	2.838	335 15	64 44	1.3092	1.2800	0.8736
26.90	+9.9771	−0.9210	+1.1955	+1.0513	+2.916	336 20	54 21	1.3173	1.2857	+0.8328
Nov. 5.88	9.9898	0.9091	1.1355	1.1476	3.002	337 30	44 12	1.3262	1.2921	0.7727
15.85	0.0035	0.8966	1.0495	1.2155	3.099	338 42	34 18	1.3363	1.2985	0.6867
25.82	0.0181	0.8848	0.9241	1.2627	3.205	339 51	24 38	1.3475	1.3041	0.5614
Dec. 5.79	0.0332	0.8748	0.7258	1.2930	3.317	340 54	15 10	1.3598	1.3083	0.3629
15.77	+0.0484	−0.8680	+0.3148	+1.3085	+3.436	341 47	5 48	1.3728	1.3107	+9.9520
25.74	0.0635	0.8649	−0.1004	1.3101	3.557	342 28	356 28	1.3861	1.3110	−9.7379
35.71	+0.0778	−0.8659	−0.6576	+1.2980	+3.677	342 58	347 6	1.3993	1.3091	−0.2949

$E = +0^{s}.001$

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 287 to 486, from the mean places, given on pages 233 to 250. In order to render exact interpolation possible through intervals of ten days, all short period terms have been omitted.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	″	″		″	″		″	″		″	″
Jan. 0	+0.21	+0.06	Feb. 15	−0.20	+0.02	Apr. 1	−0.11	−0.10	May 17	+0.20	+0.08
1	0.12	0.09	16	0.18	−0.03	2	0.00	0.10	18	+0.10	0.10
2	+0.02	0.10	17	0.11	0.08	3	+0.09	0.07	19	−0.01	0.10
3	−0.09	0.09	18	−0.01	0.10	4	0.15	−0.03	20	0.11	0.08
4	0.18	0.07	19	+0.11	0.11	5	0.17	+0.02	21	0.19	0.05
5	0.25	+0.03	20	0.21	0.09	6	0.14	0.07	22	0.24	+0.01
6	0.28	−0.01	21	0.27	−0.05	7	+0.06	0.10	23	0.24	−0.03
7	0.25	0.05	22	0.29	0.00	8	−0.04	0.11	24	0.21	0.07
8	0.19	0.09	23	0.25	+0.04	9	0.14	0.09	25	0.14	0.10
9	−0.09	0.10	24	0.18	0.08	10	0.20	+0.05	26	−0.04	0.10
10	+0.02	−0.10	25	+0.08	+0.10	11	−0.21	0.00	27	+0.05	−0.09
11	0.12	0.08	26	−0.03	0.10	12	0.17	−0.05	28	0.14	0.06
12	0.20	−0.03	27	0.13	0.08	13	−0.07	0.09	29	0.18	−0.01
13	0.22	+0.02	28	0.21	0.06	14	+0.05	0.11	30	0.17	+0.04
14	0.18	0.07	Mar. 1	0.27	+0.02	15	0.17	0.10	31	0.11	0.08
15	+0.10	0.10	2	0.28	−0.03	16	0.26	0.07	June 1	+0.02	0.11
16	−0.01	0.11	3	0.25	0.07	17	0.31	−0.03	2	−0.10	0.11
17	0.11	0.09	4	0.17	0.10	18	0.30	+0.02	3	0.19	0.08
18	0.19	+0.05	5	−0.08	0.11	19	0.25	0.06	4	0.24	+0.04
19	0.21	0.00	6	+0.03	0.09	20	0.17	0.09	5	0.24	−0.02
20	−0.18	−0.05	7	+0.12	−0.06	21	+0.06	+0.10	6	−0.18	−0.07
21	−0.09	0.09	8	0.18	−0.01	22	−0.05	0.09	7	−0.07	0.10
22	+0.02	0.11	9	0.18	+0.04	23	0.15	0.07	8	+0.06	0.11
23	0.13	0.10	10	0.14	0.08	24	0.22	+0.04	9	0.18	0.09
24	0.22	0.08	11	+0.05	0.11	25	0.25	0.00	10	0.27	0.06
25	0.27	−0.03	12	−0.05	0.11	26	0.25	−0.04	11	0.30	−0.01
26	0.27	+0.01	13	0.14	0.08	27	0.20	0.08	12	0.29	+0.03
27	0.23	0.05	14	0.19	+0.04	28	0.12	0.10	13	0.23	0.07
28	0.15	0.08	15	0.19	−0.02	29	−0.03	0.10	14	0.13	0.09
29	+0.05	0.10	16	0.13	0.07	30	+0.07	0.08	15	+0.02	0.10
30	−0.06	+0.10	17	−0.03	−0.10	May 1	+0.14	−0.05	16	−0.08	+0.09
31	0.16	0.08	18	+0.09	0.11	2	0.17	0.00	17	0.17	0.06
Feb. 1	0.24	+0.04	19	0.19	0.10	3	0.15	+0.05	18	0.23	+0.02
2	0.28	0.00	20	0.27	0.06	4	+0.08	0.09	19	0.24	−0.02
3	0.27	−0.04	21	0.30	−0.02	5	−0.02	0.11	20	0.22	0.06
4	0.22	0.08	22	0.28	+0.03	6	0.13	0.10	21	0.16	0.09
5	0.14	0.10	23	0.22	0.07	7	0.21	0.07	22	−0.07	0.10
6	−0.03	0.10	24	0.12	0.09	8	0.24	+0.02	23	+0.03	0.10
7	+0.08	0.09	25	+0.02	0.10	9	0.21	−0.03	24	0.12	0.07
8	0.17	−0.05	26	−0.09	0.09	10	0.13	0.08	25	0.18	-0.03
9	+0.21	0.00	27	−0.18	+0.07	11	−0.01	−0.11	26	+0.19	+0.02
10	0.19	+0.05	28	0.24	+0.03	12	+0.12	0.11	27	0.15	0.07
11	0.13	0.09	29	0.27	−0.01	13	0.23	0.08	28	+0.06	0.10
12	+0.03	0.11	30	0.25	0.06	14	0.30	−0.05	29	−0.05	0.11
13	−0.08	0.10	31	0.19	0.09	15	0.31	0.00	30	0.15	0.09
14	0.16	0.07	Apr. 1	−0.11	0.10	16	0.28	+0.05	July 1	0.23	+0.05
15	−0.20	+0.02	2	0.00	−0.10	17	+0.20	+0.08	2	−0.25	0.00

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	″	″		″	″		″	″		″	″
July 1	−0.23	+0.05	Aug. 16	−0.04	−0.10	Oct. 1	+0.15	+0.09	Nov. 16	−0.25	−0.02
2	0.25	0.00	17	+0.05	0.09	2	+0.04	0.10	17	0.18	0.07
3	0.21	−0.05	18	0.14	0.06	3	−0.06	0.09	18	−0.06	0.10
4	−0.11	0.09	19	0.18	−0.01	4	0.15	0.07	19	+0.07	0.11
5	+0.01	0.11	20	0.18	+0.04	5	0.21	+0.03	20	0.20	0.09
6	0.13	0.10	21	0.13	0.08	6	0.24	−0.01	21	0.29	0.06
7	0.23	0.07	22	+0.04	0.11	7	0.23	0.05	22	0.32	−0.01
8	0.29	−0.03	23	−0.07	0.11	8	0.18	0.08	23	0.30	+0.04
9	0.29	+0.02	24	0.16	0.08	9	0.10	0.10	24	0.23	0.08
10	0.24	0.06	25	0.21	+0.04	10	−0.02	0.10	25	0.13	0.10
11	+0.16	+0.09	26	−0.21	−0.02	11	+0.07	−0.08	26	+0.02	+0.10
12	+0.05	0.10	27	0.16	0.07	12	0.13	−0.04	27	−0.08	0.08
13	−0.05	0.09	28	−0.05	0.10	13	0.16	+0.01	28	0.16	0.05
14	0.15	0.07	29	+0.07	0.11	14	0.13	0.06	29	0.21	+0.01
15	0.21	+0.03	30	0.18	0.09	15	+0.07	0.09	30	0.22	−0.03
16	0.24	−0.01	31	0.26	0.06	16	−0.03	0.11	Dec. 1	0.19	0.06
17	0.23	0.05	Sept. 1	0.30	−0.01	17	0.13	0.10	2	0.13	0.09
18	0.18	0.08	2	0.27	+0.04	18	0.21	0.07	3	−0.05	0.10
19	−0.10	0.10	3	0.21	0.07	19	0.24	+0.02	4	+0.04	0.09
20	0.00	0.10	4	+0.11	0.10	20	0.21	−0.04	5	0.12	0.06
21	+0.09	−0.08	5	0.00	+0.10	21	−0.12	−0.08	6	+0.16	−0.02
22	0.17	−0.04	6	−0.10	0.09	22	0.00	0.11	7	0.16	+0.03
23	0.20	+0.01	7	0.18	0.06	23	+0.13	0.11	8	0.12	0.07
24	0.18	0.05	8	0.23	+0.02	24	0.24	0.08	9	+0.03	0.10
25	+0.11	0.09	9	0.25	−0.02	25	0.31	−0.04	10	−0.08	0.11
26	0.00	0.11	10	0.22	0.06	26	0.32	+0.01	11	0.19	0.09
27	−0.11	0.10	11	0.16	0.09	27	0.28	0.05	12	0.25	+0.05
28	0.19	0.07	12	−0.08	0.10	28	0.20	0.09	13	0.27	0.00
29	0.23	+0.02	13	+0.01	0.09	29	+0.09	0.10	14	0.22	−0.05
30	0.21	−0.04	14	0.10	0.07	30	−0.02	0.10	15	−0.12	0.09
31	−0.14	−0.08	15	+0.16	−0.03	31	−0.12	+0.08	16	+0.01	−0.11
Aug. 1	−0.03	0.11	16	0.17	+0.02	Nov. 1	0.19	+0.04	17	0.14	0.10
2	+0.10	0.11	17	0.13	0.07	2	0.23	0.00	18	0.25	0.07
3	0.20	0.08	18	+0.06	0.10	3	0.22	−0.04	19	0.31	−0.02
4	0.27	−0.04	19	−0.05	0.11	4	0.19	0.07	20	0.31	+0.03
5	0.29	0.00	20	0.14	0.09	5	0.12	0.10	21	0.25	0.07
6	0.25	+0.05	21	0.21	+0.05	6	−0.03	0.10	22	0.16	0.09
7	0.18	0.08	22	0.22	0.00	7	+0.05	0.08	23	+0.06	0.10
8	+0.08	0.10	23	0.17	−0.05	8	0.12	0.05	24	−0.05	0.09
9	−0.03	0.10	24	−0.08	0.09	9	0.16	−0.01	25	0.14	0.06
10	−0.13	+0.08	25	+0.04	−0.11	10	+0.14	+0.04	26	−0.19	+0.02
11	0.20	0.05	26	0.16	0.10	11	+0.08	0.08	27	0.21	−0.02
12	0.24	+0.01	27	0.26	0.07	12	−0.01	0.11	28	0.19	0.05
13	0.24	−0.04	28	0.31	−0.03	13	0.12	0.11	29	0.14	0.08
14	0.21	0.07	29	0.30	+0.02	14	0.21	0.08	30	−0.06	0.10
15	0.14	0.10	30	0.24	0.06	15	0.25	+0.03	31	+0.02	0.10
16	−0.04	−0.10	Oct. 1	+0.15	+0.09	16	−0.25	−0.02	32	+0.10	−0.07

WASHINGTON, JANUARY $0^{d}.490$.

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
33 Piscium . . .	4.7	0	0	56.041	+ 3.0715	− 6	11	19.17	+20.136
α Andromedæ (*Alpheratz*)	2.2	0	3	56.354	3.0958	+28	36	56.35	19.880
β Cassiopeiæ . .	2.4	0	4	34.872	3.1845	+58	40	31.69	19.861
ε Phœnicis . . .	3.9	0	5	2.935	3.0515	−46	13	19.26	19.848
22 Andromedæ . .	5.1	0	5	50.789	3.1095	+45	35	37.34	20.035
γ Pegasi . . .	2.9	0	8	48.334	+ 3.0864	+14	42	19.79	+20.021
σ Andromedæ . .	4.5	0	13	49.868	3.1274	+36	18	30.45	19.962
ι Ceti . . .	3.8	0	15	2.788	3.0570	− 9	18	2.09	19.973
ζ Tucanæ . . .	4.3	0	15	36.041	3.1483	−65	22	47.46	21.171
44 Piscium . . .	6.0	0	20	59.613	3.0743	+ 1	27	48.38	19.938
β Hydri . . .	2.9	0	21	15.025	+ 3.2014	−77	44	18.92	+20.278
α Phœnicis . . .	2.4	0	22	2.200	2.9727	−42	46	22.85	19.550
12 Ceti . . .	6.0	0	25	39.009	3.0621	− 4	25	56.41	19.920
13 Ceti . . . †	5.2	0	30	49.254	3.0871	− 4	3	57.88	19.848
ζ Cassiopeiæ . .	3.7	0	32	10.404	3.3282	+53	25	25.55	19.841
π Andromedæ . .	4.4	0	32	17.026	+ 3.1975	+33	14	45.92	+19.848
ε Andromedæ . .	4.5	0	34	0.460	3.1642	+28	50	41.83	19.572
δ Andromedæ . .	3.5	0	34	43.542	3.2019	+30	23	25.42	19.719
α Cassiopeiæ (*Schedir*) . †	*var.*	0	35	37.111	3.3864	+56	3	57.09	19.772
μ Phœnicis . . .	4.6	0	37	15.766	2.8396	−46	33	26.42	19.749
β Ceti . . .	2.2	0	39	16.406	+ 3.0125	−18	27	30.23	+19.794
ο Cassiopeiæ . .	4.7	0	39	55.622	3.3310	+47	48	50.08	19.736
21 Cassiopeiæ . .	5.6	0	39	56.789	3.9043	+74	31	5.50	19.716
ζ Andromedæ . .	4.3	0	42	46.622	3.1746	+23	47	58.28	19.620
η Cassiopeiæ . . †	3.6	0	43	53.350	3.6129	+57	21	37.94	19.203
δ Piscium . . .	4.6	0	44	13.141	+ 3.1100	+ 7	7	2.10	+19.630
λ Hydri . . .	5.0	0	45	36.956	2.1014	−75	23	28.52	19.649
20 Ceti . . .	4.9	0	48	36.683	3.0642	− 1	36	39.24	19.593
γ Cassiopeiæ . .	2.2	0	51	30.436	3.5973	+60	15	4.63	19.536
μ Andromedæ . .	3.9	0	51	58.496	3.3208	+38	1	59.12	19.562
α Sculptoris . . .	4.4	0	54	27.699	+ 2.8906	−29	49	20.10	+19.470
43 H. Cephei . . .	4.5	0	56	46.419	7.6035	+85	47	47.03	19.430
ε Piscium . . .	4.4	0	58	28.696	3.1112	+ 7	25	38.48	19.422
β Phœnicis . . . †	3.4	1	2	14.767	2.6800	−47	10	45.91	19.286
μ Cassiopeiæ . .	5.3	1	2	32.296	3.9692	+54	29	56.50	17.748
η Ceti . . .	3.6	1	4	15.810	+ 3.0175	−10	38	16.06	+19.138
β Andromedæ . .	2.4	1	4	54.710	3.3505	+35	9	53.47	19.130
τ Piscium . . .	4.7	1	6	55.199	3.2970	+29	38	0.05	19.168
ζ Piscium . . . †	5.6	1	9	14.202	3.1318	+ 7	7	15.12	19.086
κ Tucanæ . . . †	5.0	1	12	51.191	2.0397	−69	19	58.65	19.130
f Piscium . . .	5.3	1	13	21.710	+ 3.0925	+ 3	9	42.65	+19.002
υ Piscium . . .	4.7	1	14	44.146	3.2906	+26	48	44.43	18.981
θ Ceti . . .	3.8	1	19	43.451	2.9978	− 8	37	36.56	18.630
δ Cassiopeiæ . .	2.8	1	20	10.740	3.8998	+59	47	19.90	18.795
γ Phœnicis . . .	3.4	1	24	37.892	2.6078	−43	45	31.64	18.470
38 Cassiopeiæ . .	6.0	1	24	48.565	+ 4.4141	+69	49	21.10	+18.617
η Piscium . . .	3.7	1	26	52.718	3.2057	+14	54	10.21	18.620
α Ursæ Min. (*Polaris*) †	2.1	1	28	47.18*	+28.2949	+88	50	47.93	+18.562

13 Ceti, dup. $5^{m}.5$, $6^{m}.2$, 0″.3
α Cassiop., var. irreg $2^{m}.2$, $2^{m}.8$
η Cassiop. comp. $7^{m}.6$, 5″ s. pr.
β Phœnicis, dup. $4^{m}.1$, $4^{m}.1$, 1″.
ζ Piscium, star $6^{m}.5$, 24″ n.f.
κ Tucanæ, comp. 7^{m}, 6″ n.
α Ursæ Min. star 9^{m}, 18″ s. pr.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variati
		h m s	s	° ′ ″	″
40 Cassiopeiæ . .	5.5	1 31 37.106	+4.7314	+72 36 8.32	+18.4
υ Andromedæ . .	4.2	1 31 44.617	3.5096	+40 58 32.63	18.0
π Piscium . . .	5.6	1 32 32.221	3.1764	+11 42 6.95	18.4
υ Persei . . .	3.8	1 32 42.352	3.6670	+48 11 34.35	18.3
α Eridani (*Achernar*)	0.6	1 34 30.743	2.2365	−57 40 24.63	18.3
ω Cassiopeiæ . .	5.5	1 35 57.204	+4.4002	+67 36 30.89	+18.3
ν Piscium . . .	4.7	1 36 57.258	3.1196	+ 5 3 10.11	18.2
φ Persei . . .	4.2	1 38 15.729	3.7438	+50 15 21.47	18.2
τ Ceti . . .	3.6	1 40 4.335	2.7866	−16 23 23.89	19.0
ο Piscium . . .	4.5	1 40 51.021	3.1649	+ 8 43 30.92	18.1
ε Sculptoris . . . †	5.4	1 41 36.877	+2.8046	−25 28 54.98	+18.0
4 Octantis (G.) . .	5.6	1 42 13.66*	−3.7907	−85 12 15.81	18.1
ζ Ceti . . .	3.9	1 47 12.903	+2.9601	−10 45 34.01	17.8
α Trianguli . . .	3.6	1 48 10.505	3.4131	+29 9 37.26	17.6
ε Cassiopeiæ . .	3.4	1 48 11.632	4.2834	+63 14 49.70	17.8
ξ Piscium . . .	4.8	1 49 6.111	+3.1037	+ 2 45 48.25	+17.8
β Arietis . . .	2.7	1 49 53.132	3.3081	+20 23 17.03	17.6
ψ Phœnicis . . .	4.4	1 50 11.790	2.4037	−46 43 25.86	17.6
υ Ceti . . .	4.2	1 55 57.141	2.8257	−21 29 38.70	17.5
α Hydri . . .	3.0	1 56 3.199	1.8819	−61 59 17.05	17.5
50 Cassiopeiæ . .	4.1	1 56 3.841	+5.0591	+72 0 20.87	+17.5
γ Andromedæ *pr.* .	2.3	1 58 36.849	3.6708	+41 55 3.36	17.3
γ Andromedæ *seq.* .	5.1	$\Delta\alpha$ + 0.890	. . . .	$\Delta\delta$ + 4.67	. . .
α Arietis . . .	2.2	2 2 19.300	3.3759	+23 3 22.66	17.1
β Trianguli . . .	3.1	2 4 25.281	3.5612	+34 34 51.64	17.1
55 Cassiopeiæ . .	6.2	2 7 42.944	+4.6672	+66 7 19.26	+17.0
6 Persei . . .	5.4	2 7 52.635	3.9729	+50 40 0.76	16.8
ξ^1 Ceti . . .	4.5	2 8 26.379	3.1768	+ 8 26 37.21	16.9
μ Fornacis . . .	5.2	2 9 6.993	2.6379	−31 7 37.81	16.9
γ Trianguli . . .	4.1	2 12 11.815	3.5581	+33 26 59.99	16.7
67 Ceti . . .	5.7	2 12 41.561	+2.9906	− 6 49 5.03	+16.6
φ Eridani . . .	3.8	2 13 26.132	2.1412	−51 54 36.01	16.71
ο Ceti . (*Mira*) †	*var.*	2 15 0.063	3.0291	− 3 22 3.13	16.43
κ Fornacis . . .	5.4	2 18 36.412	2.7448	−24 12 24.53	16.41
δ Hydri . . .	4.3	2 20 12.842	1.0581	−69 3 1.77	16.42
ι Cassiopeiæ . . †	4.6	2 21 57.798	+4.9016	+67 0 59.52	+16.33
ξ^2 Ceti . . .	4.3	2 23 35.058	3.1863	+ 8 4 30.51	16.23
σ Ceti . . .	4.8	2 28 0.592	2.8414	−15 37 17.16	15.9
36 H. Cassiopeiæ . .	5.3	2 29 49.710	5.6362	+72 26 34.93	15.93
ν Ceti . . .	5.0	2 31 21.531	+3.1450	+ 5 13 6.93	15.81
μ Hydri . . .	5.3	2 33 27.769	−1.3535	−79 29 5.15	+15.67
ν Arietis . . .	5.4	2 33 55.801	+3.4018	+21 35 24.29	15.67
δ Ceti . . .	4.0	2 35 4.388	3.0730	− 0 2 30.64	15.63
ε Hydri . . .	4.3	2 38 15.720	0.9135	−68 38 7.12	15.45
θ Persei . . .	4.2	2 38 19.110	4.0828	+48 51 55.69	15.36
γ Ceti *seq.* . . . †	3.7	2 38 50.559	+3.1058	+ 2 52 26.16	+15.27
π Ceti . . .	4.4	2 40 1.708	2.8537	−14 13 20.52	15.34
μ Ceti . . .	4.4	2 40 17.435	+3.2392	+ 9 45 6.16	+15.31

ε Sculptoris, comp. 9^{m}, $5''$ n. f.
ο Ceti, var., 331^{d}, $1^{m}.7$–$9^{m}.6$, star 9^{m} f. 8^{s}

ι Cassiop., triple, 7^{m}, 8^{m}, $2''$, $8''$

γ Ceti, comp., $6^{m}.2$, $2''.7$

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
η Persei . . . †	3.9	2	44	24.871	+4.3569	+55	32	21.84	+15.093
41 Arietis . . .	3.7	2	44	55.057	3.5246	+26	54	24.28	14.964
β Fornacis . . .	4.5	2	45	29.480	2.5121	−32	46	0.14	15.198
σ Arietis . . .	5.5	2	46	44.504	3.3079	+14	43	41.51	14.936
τ^2 Eridani . . .	4.8	2	47	8.173	2.7200	−21	21	28.39	14.930
τ Persei . . .	4.1	2	48	9.101	+4.2359	+52	24	40.80	+14.884
η Eridani . . .	4.0	2	52	13.538	2.9302	− 9	14	23.38	14.434
ε Arietis (*mean*) . . †	4.6	2	54	17.459	3.4252	+20	59	49.15	14.513
47 H. Cephei . . .	5.7	2	54	36.058	7.8438	+79	4	49.01	14.514
θ Eridani . . . †	3.4	2	55	0.134	2.2767	−40	38	55.84	14.504
α Ceti . . .	2.8	2	57	46.923	+3.1331	+ 3	45	10.62	+14.233
γ Persei . . .	3.1	2	58	33.551	4.3274	+53	10	13.99	14.259
τ^3 Eridani . . .	4.2	2	58	36.010	2.6448	−23	57	39.39	14.217
ρ Persei . . . †	*var.*	2	59	39.611	3.8349	+38	30	27.72	14.080
μ Horologii . . .	5.2	3	1	34.954	1.4076	−60	4	14.93	14.022
θ Hydri . . .	5.5	3	2	4.023	+0.0994	−72	14	17.87	+14.060
β Persei . (*Algol*) †	*var.*	3	2	34.043	3.8931	+40	37	30.40	14.013
δ Arietis . . .	4.5	3	6	42.510	3.4259	+19	24	7.94	13.754
12 Eridani . . . †	4.0	3	8	25.015	2.5467	−29	19	32.28	14.281
48 H. Cephei . . .	5.5	3	9	21.854	7.4970	+77	25	12.87	13.528
ζ Arietis . . .	5.0	3	9	57.299	+3.4435	+20	43	34.89	+13.464
38 Horologii (G.) . . †	5.7	3	10	22.249	1.5146	−57	38	36.13	13.512
ζ Eridani . . .	4.9	3	11	39.291	2.9123	− 9	8	18.58	13.489
τ Arietis . . .	5.2	3	16	15.550	3.4592	+20	50	15.70	13.101
e Eridani . . .	4.3	3	16	29.562	+2.3980	−43	23	53.22	13.876
ι Hydri . . .	5.5	3	18	4.693	−1.5554	−77	42	10.84	+13.054
α Persei . . .	1.9	3	18	10.527	+4.2685	+49	33	21.53	12.979
o Tauri . . .	3.8	3	20	10.987	3.2253	+ 8	43	36.95	12.799
2 H. Camelopardalis .	4.4	3	22	5.726	4.8364	+59	38	29.92	12.745
ξ Tauri . . .	3.8	3	22	30.382	3.2483	+ 9	26	0.30	12.670
f Tauri . . .	4.3	3	26	7.377	+3.3089	+12	38	33.71	+12.472
ε Eridani . . . †	3.8	3	28	52.666	2.8252	− 9	44	55.12	12.307
τ^5 Eridani . . .	4.3	3	29	59.257	2.6483	−21	55	14.92	12.165
δ Persei . . .	3.1	3	36	47.724	4.2595	+47	30	48.63	11.690
δ Eridani . . .	3.7	3	39	7.675	2.8729	−10	3	14.42	12.291
ν Persei . . .	3.9	3	39	20.776	+4.0666	+42	18	28.33	+11.544
5 H. Camelopardalis .	4.7	3	41	15.607	6.2824	+71	4	6.52	11.351
η Tauri . (*Alcyone*) †	3.0	3	42	22.158	3.5614	+23	50	23.90	11.278
τ^6 Eridani . . .	4.3	3	43	8.853	2.5806	−23	30	9.05	10.790
g Eridani . . .	4.2	3	46	14.189	+2.2451	−36	27	35.93	11.019
γ Hydri . . .	3.2	3	48	33.408	−0.9663	−74	30	9.93	+10.994
ζ Persei . . .	2.9	3	48	43.339	+3.7653	+31	37	44.70	10.850
9 H. Camelopardalis . †	5.2	3	49	47.651	5.0932	+60	51	28.86	10.769
ε Persei . . . †	3.0	3	52	4.728	4.0189	+39	45	44.48	10.590
ξ Persei . . .	4.0	3	53	22.869	3.8866	+35	32	40.18	10.503
γ Eridani . . .	3.2	3	54	0.994	+2.7984	−13	45	8.99	+10.362
λ Tauri . . . †	*var.*	3	55	54.838	3.3214	+12	14	53.24	10.319
δ Reticuli . . .	4.4	3	57	22.745	+0.9407	−61	38	33.02	+10.218

η Persei, star 8^m.5, 28″ n. pr.
ε Arietis, dup., 5^m.2, 5^m.6, 1″.2
θ Eridani, comp. 4^m.4, f. 8″
ρ Persei, var. irreg., 3^m.4–4^m.2

β Persei, var. 2^d.87, 2^m.1–3^m.2
12 Eridani, comp., 7^m, 1″.4 n. pr.
38 Horologii remarkable purplish red star.
ε Eridani, comp. 9^m, s. 7″

η Tauri, quad., comps. 6^m.3, 7^m.6, 8^m.2, 117″, 181″, 190″
9 H. Camelop., comp. 8^m, 1″.9 n. f.
ε Persei, comp. 8^m, 8″.6 n. f.
λ Tauri, var., 3^d.95, 3^m.3–4^m.2

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annu Variat
		h m s	s	° ′ ″	″
ν Tauri . . .	3.9	3 58 34.812	+ 3.1895	+ 5 45 5.16	+10.
A Tauri . . . †	4.5	3 59 36.509	3.5431	+21 50 51.99	9.
c Persei . . .	4.0	4 2 24.803	4.3467	+47 29 1.99	9.
p Tauri . . .	5.6	4 5 35.430	3.6490	+26 15 26.43	9.
*o*¹ Eridani . . .	4.1	4 7 40.007	2.9273	− 7 3 39.80	9.
Groombridge 750 .	6.7	4 9 9.789	+17.5638	+85 19 42.36	+ 9.
μ Tauri . . .	4.3	4 10 51.777	3.2555	+ 8 40 39.92	9.
α Horologii . . .	3.8	4 11 9.109	1.9873	−42 30 22.50	8.
α Reticuli . . .	3.4	4 13 18.776	0.7648	−62 41 20.12	9.
γ Tauri . . .	3.9	4 14 53.842	3.4115	+15 25 14.79	8.
δ Tauri . . .	3.9	4 17 58.384	+ 3.4568	+17 20 29.92	+ 8.
*υ*⁵ Eridani . . .	4.1	4 20 48.380	2.2528	−34 12 57.91	8.
ε Tauri . . .	3.6	4 23 35.584	+ 3.5006	+18 59 25.99	8.
δ Mensæ . . .	5.6	4 23 45.420	− 4.1503	−80 24 58.57	8.
m Persei . . . †	6.1	4 27 21.611	+ 4.2148	+42 52 52.36	7.
α Tauri (*Aldebaran*)	1.1	4 30 59.038	+ 3.4399	+16 20 14.12	+ 7.
ν Eridani . . .	4.1	4 32 1.244	2.9957	− 3 31 38.92	7.
α Doradus . . .	3.5	4 32 8.225	1.2946	−55 13 21.32	7.
53 Eridani . . .	4.0	4 34 14.410	2.7455	−14 28 16.92	7.
τ Tauri . . .	4.3	4 37 4.896	3.5985	+22 47 34.14	7.
Groombridge 848 .	6.0	4 37 14.302	+ 8.0179	+75 47 11.40	+ 6.
α Cœli . . .	4.5	4 37 47.335	1.9299	−42 1 40.07	6.
4 Camelopardalis . .	5.4	4 40 50.049	4.9862	+56 36 20.45	6.
μ Eridani . . .	4.2	4 41 12.095	2.9987	− 3 24 41.33	6.
*π*³ Orionis . . .	3.3	4 45 10.216	3.2550	+ 6 48 43.41	6.
9 Camelopardalis . .	4.4	4 45 29.592	+ 5.9475	+66 11 53.08	+ 6.
i Tauri . . .	5.1	4 46 20.487	3.5075	+18 41 39.74	6.
*π*⁵ Orionis . . .	3.9	4 49 46.256	3.1239	+ 2 18 2.67	6.
ι Aurigæ . . .	2.9	4 51 23.444	3.9037	+33 1 51.25	5.8
β Camelopardalis . .	4.2	4 55 45.698	5.3253	+60 19 4.52	5.
ε Aurigæ . . . †	*var.*	4 55 47.716	+ 4.3010	+43 41 49.55	+ 5.
ζ Aurigæ . . .	3.9	4 56 27.833	4.1894	+40 57 5.07	5.
′*ι* Tauri . . .	4.7	4 57 57.252	3.5846	+21 28 4.52	5.
11 Orionis . . .	4.6	4 59 39.223	3.4265	+15 17 6.78	5.
η Aurigæ . . .	3.3	5 0 28.913	4.2040	+41 7 9.12	5.
ε Leporis . . .	3.3	5 1 49.196	+ 2.5384	−22 29 9.13	+ 4.
β Eridani . . .	2.9	5 3 37.300	2.9491	− 5 11 48.43	4.8
μ Aurigæ . . .	4.8	5 7 32.436	4.1016	+38 23 1.12	4.
19 H. Camelopardalis .	5.2	5 8 21.680	9.8315	+79 8 5.39	4.6
μ Leporis . . .	3.3	5 9 4.079	2.6939	−16 18 23.62	4.
α Aurigæ . (*Capella*)	0.2	5 10 20.020	+ 4.4286	+45 54 42.05	+ 3.
β Orionis . (*Rigel*) †	0.3	5 10 24.244	2.8822	− 8 18 0.74	4.
λ Aurigæ . . .	4.8	5 13 5.368	4.2175	+40 1 25.40	3.
τ Orionis . . .	3.7	5 13 25.814	2.9125	− 6 56 11.57	4.
o Columbæ . . .	4.9	5 14 22.816	2.1588	−34 58 44.17	3.
γ Orionis . (*Bellatrix*)	1.7	5 20 31.060	+ 3.2169	+ 6 16 21.33	+ 3.
β Tauri . . .	1.8	5 20 51.261	3.7912	+28 32 8.85	3.
17 Camelopardalis . .	5.8	5 22 2.664	+ 5.6594	+62 59 48.35	+ 3.

A Tauri, star $6^{m}.5$ f. 38^{s}, 270″ s.
m Persei, star 6^{m}, 115″ s. pr.

ε Aurigæ, var. irreg., $3^{m}.0$–$4^{m}.5$.

β Orionis, comp. $8^{m}.0$, 9″.5 s.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
β Leporis	3.0	5	24	33.629	+ 2.5703	−20	49	38.16	+2.999
χ Aurigæ	4.9	5	27	7.759	3.9039	+32	7	45.79	2.852
δ Orionis . . . †	2.5	5	27	36.744	3.0642	− 0	21	43.13	2.821
Groombridge 966	6.4	5	28	13.037	8.0081	+74	59	20.12	2.788
α Leporis	2.7	5	28	56.219	2.6457	−17	52	59.36	2.708
φ¹ Orionis	4.5	5	30	5.900	+ 3.2925	+ 9	25	55.58	+2.593
ι Orionis . . . †	2.9	5	31	13.556	2.9342	− 5	57	56.17	2.508
ε Orionis	1.8	5	31	50.945	3.0435	− 1	15	21.56	2.457
ζ Tauri	3.0	5	32	30.265	3.5849	+21	5	27.32	2.367
Groombridge 944	6.4	5	34	16.491	18.7576	+85	9	23.64	2.241
ζ Orionis . . . †	2.0	5	36	25.146	+ 3.0270	− 1	59	14.59	+2.045
α Columbæ	2.8	5	36	32.092	2.1725	−34	7	10.01	2.011
ο Aurigæ	5.5	5	39	14.172	4.6451	+49	47	23.04	1.795
ζ Leporis	3.7	5	43	3.490	2.7178	−14	51	11.74	1.480
κ Orionis	2.2	5	43	40.651	2.8449	− 9	41	57.91	1.423
δ Doradus	4.5	5	44	37.006	+ 0.1021	−65	46	4.03	+1.344
ν Aurigæ	4.2	5	45	31.726	+ 4.1573	+39	7	27.88	1.278
31 Mensæ (G.)	6.2	5	46	49.81*	−11.6877	−84	49	50.68	1.237
δ Leporis	3.9	5	47	37.345	+ 2.5796	−20	53	8.40	0.433
α Orionis (*Betelgeux*) †	*var.*	5	50	30.939	3.2478	+ 7	23	30.83	0.839
δ Aurigæ	3.9	5	52	26.811	+ 4.9418	+54	16	46.08	+0.542
η Leporis	3.8	5	52	29.264	2.7322	−14	10	57.64	0.798
β Aurigæ	2.1	5	53	13.258	4.4018	+44	56	23.48	0.587
θ Aurigæ . . . †	2.7	5	53	51.410	4.0916	+37	12	27.25	+0.446
1 Geminorum	4.3	5	58	53.563	3.6475	+23	16	7.89	−0.012
1 Puppis (G.) . . †	6.2	6	1	59.905	+ 1.7258	−45	2	9.94	+0.050
ν Orionis	4.4	6	2	39.731	3.4264	+14	46	46.59	−0.258
22 H. Camelopardalis	4.7	6	9	22.370	6.6185	+69	21	6.31	0.933
η Geminorum . . †	*var.*	6	9	41.230	3.6227	+22	31	57.53	0.863
2 Lyncis	4.4	6	12	2.308	5.2986	+59	2	36.62	1.023
ζ Canis Majoris	3.1	6	17	0.624	+ 2.3018	−30	1	29.48	−1.510
μ Geminorum	3.2	6	17	45.494	3.6307	+22	33	31.32	1.666
ψ¹ Aurigæ	5.1	6	18	16.660	4.6260	+49	19	58.85	1.600
β Canis Majoris	2.0	6	18	54.730	2.6415	−17	54	44.72	1.649
8 Monocerotis . . †	4.5	6	19	12.684	3.1802	+ 4	38	14.57	1.669
α Argûs (*Canopus*)	−0.9	6	22	2.570	+ 1.3319	−52	38	54.29	−1.916
10 Monocerotis	5.0	6	23	42.826	2.9641	− 4	42	29.32	2.064
ν Geminorum	4.1	6	23	51.416	3.5629	+20	16	3.07	2.099
8 Lyncis	6.0	6	29	50.129	5.4923	+61	33	29.51	2.878
ξ² Canis Majoris	4.5	6	31	27.139	2.5157	−22	53	43.72	2.708
23 H. Camelopardalis	5.6	6	31	34.676	+10.3004	+79	39	36.15	−3.386
51 Aurigæ	5.7	6	32	42.055	4.1598	+39	28	3.71	2.963
γ Geminorum	1.9	6	32	44.662	3.4670	+16	28	24.80	2.902
ν Argûs	3.2	6	35	7.872	1.8367	−43	7	12.32	3.080
S Monocerotis . . †	4.7	6	36	14.531	3.3047	+ 9	58	34.03	3.165
ε Geminorum	3.2	6	38	38.511	+ 3.6929	+25	13	2.12	−3.382
ξ Geminorum	3.4	6	40	27.791	3.3684	+12	59	21.19	3.713
ψ⁵ Aurigæ	5.3	6	40	32.631	+ 4.3299	+43	39	50.83	−3.368

δ Orionis, star 6^{m}.9, 52″.6 n.
ι Orionis, comp. 7^{m}.3, 11″.5 s.f.
ζ Orionis, comp. 4^{m}.2, 2″.4 s.f.

α Orionis, red star, var. irreg. 1^{m}.0–1^{m}.4.
θ Aurigæ, comp. 7^{m}.5, 2″.5 n. pr.
1 Puppis, star, 5^{m}.8, 150″ s. f.

η Gem., var. 231^{d}.4, 3^{m}.2–4^{m}.2, comp. 8^{m}.8, 1″.2 n. pr.
8 Monoc., star, 6^{m}.5, 13″.7 n. f.
S Monoc., comp. 8^{m}.8, 2″.9 s. pr.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Ann Variat
		h	m	s	s	°	′	″	″
α Canis Majoris (*Sirius*) †	−1.6	6	41	21.503	+ 2.6435	−16	35	50.96	− 4
18 Monocerotis	4.7	6	43	22.579	3.1281	+ 2	30	25.59	3.
43 Camelopardalis	5.1	6	44	26.385	6.4890	+68	59	23.81	3.
θ Geminorum	3.6	6	47	7.371	+ 3.9582	+34	3	57.47	4.
ζ Mensæ	5.6	6	47	13.373	− 4.9402	−80	43	26.13	4.
α Pictoris	3.3	6	47	18.623	+ 0.6177	−61	50	56.29	− 3.
τ Argûs	2.8	6	47	48.120	1.4884	−50	30	43.54	4.
15 Lyncis †	4.5	6	49	50.183	5.2072	+58	32	12.54	4.
θ Canis Majoris	4.2	6	50	11.684	2.7879	−11	55	48.14	4.
ε Canis Majoris †	1.6	6	55	14.745	2.3574	−28	51	15.73	4.
ζ Geminorum †	*var.*	6	59	0.566	+ 3.5607	+20	41	50.41	− 5.
o² Canis Majoris	3.1	6	59	26.006	2.5048	−23	42	24.87	5.
γ Canis Majoris	4.1	6	59	52.075	2.7148	−15	30	19.71	5.
51 H. Cephei	5.3	7	0	36.40*	29.2609	+87	11	10.74	5.
δ Canis Majoris	2.0	7	4	53.617	2.4381	−26	15	21.57	5.
63 Aurigæ	5.1	7	5	44.592	+ 4.1330	+39	27	42.74	− 5.
51 Geminorum	5.3	7	8	26.073	+ 3.4481	+16	18	20.82	5.
γ² Volantis †	3.9	7	9	28.784	− 0.5009	−70	21	33.98	5.
25 H. Camelopardalis	5.1	7	13	3.826	+12.8308	+82	34	49.19	6.3
λ Geminorum	3.6	7	13	9.121	3.4503	+16	41	46.83	6.3
π Argûs	2.7	7	14	6.324	+ 2.1189	−36	56	33.80	− 6.3
δ Geminorum †	3.5	7	14	59.326	+ 3.5865	+22	8	29.74	6.4
δ Volantis	4.0	7	16	53.017	− 0.0191	−67	47	59.52	6.6
7 Octantis (G.)	6.4	7	17	21.00*	−20.1981	−86	53	46.93	6.6
ι Geminorum	3.9	7	20	23.247	+ 3.7305	+27	58	11.75	6.9
η Canis Majoris	2.4	7	20	41.649	+ 2.3737	−29	8	4.88	− 6.9
Groombridge 1308	5.8	7	21	56.688	6.2758	+68	38	34.11	7.0
β Canis Minoris	3.1	7	22	29.283	3.2555	+ 8	27	48.26	7.1
ρ Geminorum	4.2	7	23	34.926	3.8632	+31	57	23.86	6.9
σ Argûs †	3.3	7	26	30.095	1.9018	−43	7	36.45	7.2
α² Geminorum (*Castor*)	2.0	7	29	6.903	+ 3.8333	+32	4	42.13	− 7.6
α¹ Geminorum	2.8	Δα − 0.268			. . . .	Δδ − 4.13			. . .
25 Monocerotis	5.2	7	33	0.118	2.9819	− 3	55	5.26	7.8
α Can. Min. (*Procyon*) †	0.5	7	34	48.049	3.1422	+ 5	26	45.67	9.0
24 Lyncis	5.0	7	35	44.298	5.0942	+58	54	46.08	8.1
κ Geminorum †	3.7	7	39	15.496	+ 3.6266	+24	36	18.14	− 8.4
β Geminorum (*Pollux*)	1.2	7	40	3.342	3.6759	+28	14	5.24	8.5
4 Puppis	5.1	7	41	59.272	2.7636	−14	21	14.68	8.6
ξ Argûs	3.5	7	45	40.642	2.5232	−24	38	35.80	8.91
φ Geminorum	5.0	7	48	14.205	3.6767	+26	59	21.61	9.14
26 Lyncis	5.7	7	48	27.390	+ 4.3817	+47	47	18.83	− 9.14
Groombridge 1374	5.6	7	49	55.560	7.2460	+74	8	57.40	9.28
χ Argûs	3.6	7	54	35.566	1.5259	−52	45	5.10	9.60
ω Cancri	5.9	7	55	43.773	3.6340	+25	37	44.57	9.70
χ Geminorum	5.0	7	58	14.368	3.6905	+28	2	10.46	9.94
27 Lyncis	4.9	8	1	59.808	+ 4.5304	+51	45	20.36	−10.17
ρ Argûs	2.9	8	3	52.873	2.5546	−24	3	20.39	10.26
3 H. Ursæ Majoris	5.5	8	4	16.208	+ 6.0132	+68	43	42.92	−10.34

15 Lyncis, dup., $4^m.9$, $6^m.2$, 0″.7
ε Can. Maj., comp. 9^m, 7″.8 s. f.
ζ Gem., var., $10^d.15$, $3^m.7$–$4^m.3$

γ² Volantis, comp. $5^m.8$, 12″.9 n. pr.
δ Gem., comp. 8^m, 7″.0 s. pr.

σ Argûs, star. 8^m, 22″.4 n. f.
κ Gem., comp. $8^m.5$, 6″.6 s. pr.

Positions given for Sirius and Procyon are those of the centers of their orbits. Corrections given on page i remain to be applied to reduce to the positions of the stars.

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Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
γ Argûs	†	2.2	8	6	52.997	+ 1.8498	−47	4	58.11	−10.551
ζ Cancri (*mean*)	†	4.7	8	7	16.908	3.4446	+17	54	28.86	10.698
Bradley 1147		5.7	8	8	46.222	7.6233	+76	1	15.26	10.687
20 Puppis		5.0	8	9	22.798	2.7580	−15	31	42.40	10.723
β Cancri		3.8	8	11	51.148	3.2557	+ 9	27	4.83	10.959
Groombridge 1119		7.0	8	12	47.195	+60.8844	+88	53	33.49	−10.958
31 Lyncis		4.4	8	16	57.293	4.1212	+43	27	53.86	11.378
d¹ Cancri		5.9	8	18	26.499	3.4392	+18	36	32.57	11.417
ε Argûs		1.7	8	20	45.013	1.2339	−59	13	56.92	11.544
30 Monocerotis		4.0	8	21	21.869	2.9996	− 3	37	30.56	11.615
o Ursæ Majoris		3.5	8	23	7.895	+ 5.0130	+61	0	24.30	−11.833
θ Chamæleontis		4.3	8	23	14.365	− 1.7455	−77	12	27.09	11.711
Groombridge 1450		6.0	8	27	19.808	+ 3.9095	+38	18	43.80	12.196
η Cancri		5.5	8	27	44.286	3.4745	+20	44	2.44	12.101
Groombridge 1446		6.3	8	30	10.460	6.7470	+73	55	53.54	12.332
δ Hydræ		4.2	8	33	6.285	+ 3.1782	+ 6	0	15.62	−12.431
σ Hydræ		4.5	8	34	15.829	3.1383	+ 3	38	38.74	12.509
γ Cancri		4.7	8	38	18.724	3.4770	+21	46	42.63	12.815
δ Cancri		4.2	8	39	48.015	3.4140	+18	28	15.82	13.112
α Pyxidis		3.7	8	40	8.151	2.4110	−32	52	33.02	12.883
ι Cancri	†	4.2	8	41	29.822	+ 3.6381	+29	4	30.72	−13.035
ε Hydræ	†	3.5	8	42	13.401	3.1798	+ 6	44	6.21	13.082
δ Argûs	†	2.0	8	42	19.546	1.6517	−54	23	35.05	13.140
σ² Cancri (*mean*)	†	5.5	8	49	0.087	3.6682	+30	54	21.02	13.500
ζ Hydræ		3.3	8	50	50.980	3.1745	+ 6	16	24.59	13.590
ι Ursæ Majoris		3.1	8	53	19.591	+ 4.1232	+48	22	48.27	−14.004
α Cancri		4.3	8	53	47.140	3.2846	+12	11	28.42	13.826
b¹ Carinæ	†	5.1	8	54	52.095	1.4682	−58	53	50.04	13.872
κ Ursæ Majoris		3.7	8	57	45.666	4.1111	+47	29	50.64	14.102
σ² Ursæ Majoris	†	4.9	9	2	50.678	5.3234	+67	29	4.80	14.416
κ Cancri		5.1	9	3	5.466	+ 3.2528	+11	0	53.63	−14.377
λ Argûs		2.2	9	4	49.932	+ 2.2061	−43	5	6.36	14.477
ζ Octantis		5.4	9	9	22.33*	− 8.1044	−85	19	13.38	14.700
θ Hydræ		3.8	9	9	53.489	+ 3.1237	+ 2	40	39.82	15.085
β Argûs		1.8	9	12	15.655	0.6703	−69	21	46.37	14.818
83 Cancri		6.6	9	14	11.071	+ 3.3537	+18	4	13.83	−15.160
ι Argûs		2.2	9	14	47.178	1.6041	−58	54	50.40	15.052
40 Lyncis		3.3	9	15	49.215	3.6638	+34	45	24.73	15.106
θ Pyxidis		4.9	9	17	40.929	2.6513	−25	35	57.63	15.257
α Hydræ		2.2	9	23	21.705	2.9487	− 8	17	6.89	15.510
h Ursæ Majoris		3.8	9	24	45.893	+ 4.7662	+63	26	19.15	−15.596
1 H. Draconis		4.6	9	24	55.328	8.8086	+81	42	28.51	15.656
d Ursæ Majoris		4.6	9	26	54.099	5.3619	+70	12	33.07	15.666
θ Ursæ Majoris		3.3	9	27	6.825	4.0309	+52	4	11.99	16.292
ψ Argûs	†	3.6	9	27	18.604	2.3593	−40	5	24.31	15.721
ξ Leonis		5.1	9	27	18.736	+ 3.2370	+11	40	52.43	−15.843
10 Leonis Minoris		4.6	9	28	57.597	+ 3.6854	+36	46	48.18	15.869
ζ Chamæleontis		5.2	9	36	27.306	− 1.6483	−80	33	18.17	−16.222

γ Argûs, star 5^{m}, $42''.5$ s. pr.
ζ Cancri, triple; binary $5^{m}.6$, $6^{m}.3$, $1''$ with comp. $6^{m}.0$, $5''.4$ s. f.
ι Cancri, star $6^{m}.6$, $30''.6$ n. pr.
ε Hydræ, triple; binary $3^{m}.5$, $6^{m}.8$, $0''.2$, with comp. $7^{m}.8$, $3''.3$
δ Argûs, comp. 5^{m}, $2''$ s
σ² Cancri, dup. $5^{m}.9$, $6^{m}.4$, $1''.4$
b¹ Carinæ, comp. $7^{m}.2$, 5^{s} f.
σ² Urs. Maj., binary $4^{m}.9$, 8^{m}, $1''.3$
ψ Argûs, dup. $3^{m}.8$, $6^{m}.0$, $0''.8$

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
ο Leonis	3.8	9	36	33.755	+3.2051	+10	17	3.10	−16.279
θ Antliæ	5.0	9	40	22.061	2.6730	−27	22	31.02	16.410
ε Leonis	3.1	9	40	58.360	3.4111	+24	10	14.51	16.491
υ Ursæ Majoris	3.9	9	44	53.159	4.2929	+59	26	37.99	16.819
υ Argûs . . . †	3.2	9	44	57.187	1.5009	−64	40	22.66	16.681
6 Sextantis	6.0	9	46	54.063	+3.0245	− 3	50	23.22	−16.788
μ Leonis	4.1	9	47	52.504	3.4173	+26	24	45.11	16.860
Groombridge 1586	6.0	9	50	43.307	5.4327	+73	17	20.77	17.000
19 Leonis Minoris	5.2	9	52	25.343	3.6854	+41	27	56.78	17.041
φ Argûs	3.7	9	53	50.455	2.1015	−54	9	29.79	17.105
π Leonis	4.9	9	55	40.203	+3.1723	+ 8	27	26.29	−17.194
η Leonis	3.6	10	2	38.678	3.2728	+17	10	56.99	17.479
α Leonis . (*Regulus*)	1.3	10	3	47.626	3.1983	+12	23	16.58	17.525
λ Hydræ	3.8	10	6	23.730	2.9247	−11	55	42.72	17.720
q Velorum	4.1	10	11	7.347	2.5128	−41	41	43.90	17.794
32 Ursæ Majoris	5.7	10	11	48.259	+4.3945	+65	32	16.45	−17.865
ζ Leonis	3.6	10	11	54.612	3.3424	+23	50	46.74	17.860
λ Ursæ Majoris	3.5	10	11	55.004	3.6314	+43	20	39.66	17.896
γ Leonis *pr.* . . . †	2.6	10	15	14.004	3.3117	+20	16	37.13	18.139
μ Ursæ Majoris	3.2	10	17	12.689	3.5863	+41	55	56.86	18.036
30 H. Ursæ Majoris	4.9	10	17	57.078	+4.3631	+66	0	6.57	−18.109
30 H. Camelopardalis	5.3	10	20	42.090	7.5937	+82	59	48.65	18.184
μ Hydræ	4.1	10	21	55.835	2.9005	−16	23	48.71	18.317
31 Leonis Minoris	4.4	10	22	54.941	3.4794	+37	8	53.58	18.386
α Antliæ	4.4	10	23	12.887	2.7423	−30	37	47.62	18.307
36 Ursæ Majoris	4.8	10	25	7.991	+3.8615	+56	25	18.94	−18.392
9 H. Draconis	5.0	10	27	49.200	5.1872	+76	9	23.42	18.455
ρ Leonis	3.8	10	28	17.074	3.1617	+ 9	44	58.34	18.465
33 Sextantis	6.4	10	37	1.681	3.0519	− 1	17	20.22	18.857
41 Leonis Minoris	5.0	10	38	44.574	3.2672	+23	38	20.29	18.789
θ Argûs	3.0	10	39	53.091	+2.1322	−63	56	39.12	−18.860
42 Leonis Minoris	5.4	10	41	5.186	3.3427	+31	8	8.07	18.910
η Argûs . . . †	*var.*	10	41	43.271	2.3206	−59	13	55.88	18.897
μ Argûs . . . †	2.8	10	43	4.037	2.5734	−48	57	56.91	19.008
l Leonis	5.3	10	44	44.317	3.1565	+11	0	1.69	19.008
δ² Chamæleontis . . †	4.6	10	44	59.235	+0.5951	−80	5	11.68	−18.985
ν Hydræ	3.3	10	45	22.816	2.9582	−15	44	35.32	18.782
46 Leonis Minoris	3.9	10	48	30.383	3.3638	+34	40	43.79	19.301
54 Leonis . . . †	4.5	10	50	57.560	3.2532	+25	12	31.41	19.161
ι Antliæ	4.7	10	52	42.719	2.7958	−36	40	30.90	19.326
Groombridge 1706	6.3	10	53	6.586	+4.8918	+78	13	52.25	−19.233
α Crateris	4.2	10	55	34.975	2.9206	−17	50	26.80	19.151
d Leonis	5.0	10	56	7.183	3.0992	+ 4	4	45.97	19.294
β Ursæ Majoris	2.4	10	56	39.674	3.6413	+56	50	37.14	19.259
α Ursæ Majoris	2.0	10	58	25.948	+3.7294	+62	12	55.90	19.398
η Octantis	6.3	10	59	56.35*	−0.3529	−84	7	52.51	−19.366
χ Leonis	4.7	11	0	34.917	+3.0962	+ 7	48	4.64	19.416
*p*⁴ Leonis	5.7	11	2	31.062	+3.0613	+ 2	25	21.76	−19.499

υ Argûs, comp. $6^m.0$, 4″.9 s. f. | η Argûs, var., irreg., $1^m.6$–$6^m.6$ | δ² Cham., star $5^m.5$ pr. 32^s, 256″ s.

γ Leonis, comp. $3^m.8$, 3″.7 s. f. | μ Argûs, comp. 7^m, 2″.2 n. f. | 54 Leonis, comp. $6^m.3$, 6″.4 s. f.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
ψ Ursæ Majoris . .	3.2	11 4 50.083	+3.3855	+44 57 55.31	−19.500
β Crateris . . .	4.5	11 7 25.582	2.9475	−22 21 22.52	19.627
δ Leonis . . .	2.6	11 9 32.238	3.1954	+20 59 42.12	19.702
θ Leonis . . .	3.4	11 9 43.709	3.1506	+15 53 59.27	19.650
ν Ursæ Majoris . .	3.7	11 13 50.254	3.2482	+33 33 49.59	19.614
δ Crateris . . .	3.8	11 15 2.383	+2.9973	−14 18 46.79	−19.466
σ Leonis . . .	4.1	11 16 42.175	3.0950	+ 6 30 3.20	19.702
π Centauri . . .	4.3	11 17 4.821	2.7258	−54 1 10.53	19.708
ι Leonis . . . †	4.0	11 19 26.506	3.1287	+11 0 11.12	19.816
τ Leonis . . .	5.2	11 23 30.899	3.0858	+ 3 19 48.10	19.809
λ Draconis . . .	4.1	11 26 18.842	+3.5975	+69 48 21.10	−19.850
ξ Hydræ . . .	3.7	11 28 46.165	2.9461	−31 22 54.27	19.914
λ Centauri . . .	3.3	11 31 48.391	2.7497	−62 32 38.11	19.921
υ Leonis . . .	4.5	11 32 32.727	3.0716	− 0 20 55.75	19.863
π Chamæleontis . .	5.7	11 33 42.373	2.4522	−75 25 13.65	19.936
3 Draconis . . .	5.5	11 37 41.275	+3.3740	+67 13 15.34	−19.916
ζ Crateris . . .	4.9	11 40 24.116	3.0376	−17 52 21.25	20.013
χ Ursæ Majoris . .	3.8	11 41 30.909	3.1804	+48 15 22.62	19.961
β Leonis .(*Denebola*)	2.2	11 44 40.466	3.0625	+15 3 10.28	20.119
β Virginis . . .	3.8	11 46 12.935	3.1252	+ 2 14 58.01	20.284
Groombridge 1830 .	6.5	11 48 1.607	+3.4680	+38 20 9.50	−25.802
γ Ursæ Majoris . .	2.5	11 49 18.844	3.1704	+54 10 22.53	20.020
π Virginis . . .	4.6	11 56 27.958	3.0743	+ 7 5 37.95	20.075
ο Virginis . . .	4.2	12 0 49.737	3.0571	+ 9 12 37.98	20.013
δ Centauri . . .	2.9	12 3 53.700	3.0949	−50 14 36.97	20.073
ε Corvi . . .	3.2	12 5 41.963	+3.0810	−22 8 29.48	−20.037
4 H. Draconis . .	5.1	12 8 11.109	2.8489	+78 5 38.75	20.013
δ Crucis . . .	3.1	12 10 34.538	3.1744	−58 16 15.14	20.063
δ Ursæ Majoris . .	3.4	12 11 10.664	2.9853	+57 30 37.55	20.016
γ Corvi . . .	2.8	12 11 22.859	3.0816	−17 3 51.82	20.004
2 Canum Venaticorum . †	5.8	12 11 49.308	+3.0163	+41 8 19.46	−20.065
β Chamæleontis . .	4.4	12 13 16.479	3.4458	−78 50 4.95	19.995
Bradley 1672 . .	6.3	12 14 27.330	0.3543	+88 10 35.93	19.948
η Virginis . . .	4.0	12 15 30.360	3.0693	− 0 11 20.23	20.027
α^1 Crucis . . .	1.6	12 21 48.244	3.3114	−62 37 21.44	19.994
α^2 Crucis . . .	2.1	$\Delta\alpha + 0.614$	. . . .	$\Delta\delta - 1.28$	. . . .
20 Comæ . . .	5.7	12 25 24.162	+3.0184	+21 22 20.06	−19.958
δ Corvi . . . †	3.1	12 25 24.761	3.1011	−16 2 12.27	20.071
γ Crucis . . . †	1.6	12 26 23.117	3.3029	−56 37 53.72	20.174
8 Canum Venaticorum .	4.3	12 29 39.769	2.8566	+41 49 28.61	19.599
κ Draconis . . .	3.9	12 29 49.192	+2.5781	+70 15 43.85	−19.866
β Corvi . . .	2.8	12 29 51.969	3.1453	−22 55 16.60	19.937
24 Comæ *seq.* . . †	5.2	12 30 48.999	3.0107	+18 51 1.06	19.852
α Muscæ . . .	2.9	12 32 2.447	3.5405	−68 39 42.54	19.879
χ Virginis . . .	4.8	12 34 48.355	3.0937	− 7 31 20.80	19.846
γ Centauri . . . †	2.4	12 36 46.068	+3.2942	−48 29 15.66	−19.808
γ Virginis (*mean*). . †	2.9	12 37 18.170	3.0397	− 0 58 40.29	19.777
ρ Virginis . . .	5.0	12 37 31.937	+3.0372	+10 42 33.53	−19.884

ι Leonis, comp. $6^m.8$, 2″.6 n. f.
2 Can. Ven., star 8^m, 11″.6 s. pr.
δ Corvi, star 8^m, 24″.4 s. pr.

γ Crucis, star $6^m.6$, 85″ n. f.
24 Comæ, star $6^m.7$, 20″.6 pr.
γ Cent., dup., $3^m.1$, $3^m.1$, 1″.7

γ Virginis, binary, $3^m.7$, $3^m.7$, 6″.2, P = 328°

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Name of Star.	Magni-tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
76 Ursæ Majoris	5.9	12	37	48.758	+2.6318	+63	11	6.26	−19.792
β Crucis	1.5	12	42	41.198	3.4816	−59	13	7.95	19.732
ι Octantis	5.4	12	45	49.27*	5.9467	−84	39	23.48	19.622
31 Comæ	5.1	12	47	30.635	2.9240	+28	0	30.44	19.641
32 H. Camelop. *seq.* †	5.3	12	48	29.098	0.4368	+83	52	49.22	19.582
n Centauri	4.3	12	48	40.122	+3.3125	−39	42	40.88	−19.630
ε Ursæ Majoris (*Alioth*)	1.7	12	50	14.992	2.6485	+56	25	35.19	19.578
δ Virginis	3.7	12	51	16.246	3.0208	+ 3	51	52.61	19.606
α Canum Venat. *seq.* †	2.9	12	52	0.425	2.8107	+38	46	57.43	19.483
δ Muscæ	3.6	12	56	20.036	4.0712	−71	5	6.75	19.474
ε Virginis	3.0	12	57	53.754	+2.9865	+11	25	16.14	−19.395
θ Virginis †	4.4	13	5	29.725	3.1032	− 5	4	48.45	19.273
43 Comæ	4.3	13	7	51.711	2.8026	+28	18	49.92	18.294
20 Canum Venaticorum	4.7	13	13	41.361	2.6957	+41	1	30.61	19.003
γ Hydræ	3.3	13	14	14.571	3.2553	−22	43	5.04	19.055
ι Centauri	2.9	13	15	45.380	+3.3614	−36	15	32.24	−19.057
*ζ*¹ Ursæ Maj. (*Mizar*) †	2.4	13	20	27.983	2.4223	+55	22	27.23	18.852
*ζ*² Ursæ Majoris	4.0	$\Delta\alpha$ + 0.958			. . . .	$\Delta\delta$ − 12.69			. . . .
α Virginis (*Spica*)	1.2	13	20	39.619	3.1569	−10	42	45.65	18.849
Groombridge 2001	6.1	13	23	56.342	1.5242	+72	50	16.10	18.735
70 Virginis	5.2	13	24	13.425	+2.9340	+14	14	16.10	−19.291
κ Octantis	5.6	13	26	47.35*	9.0654	−85	20	46.30	18.649
ζ Virginis	3.4	13	30	18.571	3.0545	− 0	9	23.36	18.470
17 H. Canum Venaticorum	5.0	13	30	57.527	2.6818	+37	37	22.01	18.492
ε Centauri	2.6	13	34	25.787	3.7797	−53	1	46.70	18.407
m Virginis	5.2	13	37	5.765	+3.1451	− 8	16	9.85	−18.241
τ Boötis	4.5	13	43	10.518	2.8508	+17	53	5.85	18.022
η Ursæ Majoris (*Alkaid*)	1.9	13	44	9.237	2.3681	+49	44	31.66	18.034
89 Virginis	5.1	13	45	11.724	3.2539	−17	42	22.09	18.011
ζ Centauri	3.1	13	50	10.046	3.7251	−46	51	55.89	17.838
η Boötis	2.8	13	50	35.398	+2.8567	+18	49	42.32	−18.120
θ Apodis †	*var.*	13	56	54.475	5.7369	−76	22	56.27	17.523
τ Virginis	4.3	13	57	16.114	3.0512	+ 1	57	37.07	17.507
11 Boötis	6.1	13	57	16.564	2.7216	+27	48	5.44	17.473
β Centauri	0.9	13	57	44.614	4.2049	−59	57	31.06	17.491
π Hydræ	3.5	14	1	28.215	+3.4092	−26	16	6.86	−17.441
θ Centauri	2.3	14	1	36.959	3.5193	−35	56	50.41	17.814
α Draconis	3.6	14	2	3.680	1.6244	+64	47	11.78	17.258
d Boötis	4.8	14	6	28.652	2.7371	+25	29	54.73	17.147
κ Virginis	4.3	14	8	18.365	+3.1967	− 9	52	26.03	16.853
4 Ursæ Minoris	5.0	14	9	9.894	−0.2831	+77	57	5.64	−16.920
ι Virginis	4.2	14	11	30.164	+3.1424	− 5	35	26.04	17.263
α Boötis (*Arcturus*)	0.2	14	11	44.294	2.7355	+19	37	46.86	18.827
δ Octantis	4.1	14	13	0.04*	9.2358	−83	16	30.72	16.778
λ Boötis	4.3	14	13	6.956	2.2832	+46	28	58.08	16.608
λ Virginis	4.6	14	14	27.189	+3.2407	−12	58	32.70	−16.673
2 Libræ	6.3	14	18	47.807	3.2236	−11	19	18.27	16.547
θ Boötis	4.1	14	22	16.199	+2.0433	+52	14	52.32	−16.711

32 H.Cam., star $5^m.8$, 21″.6 n.pr.
α Can.Ven., star 5^m, 19″.8 s. pr.

θ Virginis, comp. 9^m, 7″.1 n. pr.
*ζ*¹ Urs. Maj., star Alcor $4^m.0$, f. $79^s.2$, 222″ n.

θ Apodis, var. irreg. $5^m.5$–$6^m.6$

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
f Boötis	5.4	14	22	27.332	+ 2.7901	+19	36	46.95	−16.282
φ Virginis †	5.0	14	23	46.191	+ 3.0889	− 1	50	34.46	16.233
5 Ursæ Minoris	4.4	14	27	41.465	− 0.1639	+76	4	42.15	16.004
ρ Boötis	3.8	14	28	7.449	+ 2.5865	+30	44	54.38	15.889
γ Boötis	3.0	14	28	36.949	2.4172	+38	41	2.39	15.832
η Centauri	2.6	14	30	2.433	+ 3.7965	−41	46	50.13	−15.933
σ Boötis	4.5	14	30	56.196	2.6131	+30	7	5.78	15.728
α Centauri †	0.1	14	33	44.887	4.0539	−60	28	51.79	14.978
33 Boötis	5.4	14	35	38.267	2.2342	+44	46	30.45	15.642
α Apodis	3.8	14	37	7.077	7.2906	−78	40	50.88	15.540
μ Virginis	4.0	14	38	31.574	+ 3.1586	− 5	17	5.53	−15.760
ε Boötis †	2.7	14	41	13.874	2.6203	+27	26	10.39	15.277
109 Virginis	3.8	14	41	53.993	3.0311	+ 2	15	17.01	15.283
8 Libræ	5.3	14	45	55.621	3.3131	−15	38	24.78	15.091
α Libræ	2.9	14	46	7.066	3.3136	−15	41	5.97	15.083
Groombridge 2164	5.7	14	49	15.363	+ 1.5201	+59	38	35.32	−14.705
β Ursæ Minoris	2.2	14	50	56.673	− 0.2056	+74	30	24.98	14.721
ξ² Libræ	5.6	14	52	5.929	+ 3.2503	−11	3	47.57	14.655
Piazzi 221	5.8	14	52	9.604	2.8297	+14	47	35.80	14.662
β Lupi	2.8	14	52	53.439	3.9127	−42	47	18.06	14.669
δ Libræ †	*var.*	14	56	22.490	+ 3.2011	− 8	10	41.91	−14.412
β Boötis	3.6	14	58	42.402	2.2600	+40	43	45.32	14.294
γ Scorpii	3.4	14	59	1.997	3.5046	−24	56	40.36	14.282
ψ Boötis	4.7	15	0	45.623	2.5703	+27	16	56.64	14.141
c Boötis	5.0	15	3	31.422	+ 2.6347	+25	12	12.50	14.139
Groombridge 2283	7.2	15	4	39.67*	−19.5980	+87	33	52.17	−13.852
ζ Lupi	3.5	15	6	5.942	+ 4.2911	−51	46	21.08	13.858
ι Libræ	4.7	15	7	18.950	3.4140	−19	28	1.29	13.770
γ Trianguli Australis	3.1	15	10	51.701	5.5513	−68	21	46.61	13.529
3 Serpentis	5.4	15	10	54.767	2.9799	+ 5	15	28.84	13.488
δ Boötis	3.5	15	12	2.148	+ 2.4193	+33	38	6.18	−13.536
β Libræ	2.7	15	12	22.618	+ 3.2247	− 9	3	58.50	13.413
γ Ursæ Minoris	3.1	15	20	51.406	− 0.1165	+72	8	23.93	12.815
μ Boötis *pr.* †	4.5	15	21	14.496	+ 2.2663	+37	40	41.66	12.721
τ¹ Serpentis	5.5	15	21	47.983	2.7800	+15	43	47.10	12.788
ι Draconis	3.5	15	23	0.992	+ 1.3332	+59	16	0.98	−12.672
ρ Octantis	5.7	15	23	16.56*	13.3221	−84	10	52.70	12.584
32 Libræ	5.9	15	23	24.217	3.3786	−16	25	2.62	12.699
β Coronæ Borealis	3.7	15	24	17.001	2.4738	+29	24	5.63	12.518
ν¹ Boötis	5.2	15	27	50.416	2.1552	+41	7	32.43	12.366
γ Lupi (*mean*) †	3.0	15	29	24.269	+ 3.9865	−40	52	43.17	−12.293
γ Libræ	4.0	15	30	42.799	3.3522	−14	30	11.88	12.147
α Coronæ Borealis	2.3	15	31	2.773	2.5394	+27	0	12.48	12.230
ζ Coronæ Borealis *seq.* †	5.1	15	36	8.373	2.2596	+36	54	52.07	11.784
α Serpentis	2.8	15	40	1.843	2.9530	+ 6	41	43.84	11.453
β Serpentis	3.7	15	42	13.108	+ 2.7684	+15	41	24.84	−11.394
κ Serpentis	4.3	15	44	52.065	2.6995	+18	24	23.07	11.246
μ Serpentis	3.6	15	45	7.820	+ 3.1283	− 3	10	3.93	−11.155

φ Virginis, comp. 9^{m}, $4''.5$ s. f.
ε Boötis, comp. $5^{m}.1$, $2''.8$ n. pr.
δ Libræ, var., $2^{d}.33$, $4^{m}.8$–$6^{m}.2$
μ Boötis, star $6^{m}.7$, $108''$ s.
γ Lupi, binary $3^{m}.7$, $3^{m}.9$, $0''.4$
ζ Cor. Bor., comp., $6^{m}.0$, $6''.2$ n. pr.

α Centauri, dup., $0^{m}.3$, $1^{m}.7$; companion s. pr. The position given is that of the center of gravity of the system. Corrections given on page ix remain to be applied to reduce to the position of α² Centauri.

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Name of Star.			Magnitude.	Right Ascension.			Annual Variation.	Declination.			Ann Varia
				h	m	s	s	°	′	″	′
12	H. Draconis		5.1	15	45	21.146	+0.9070	+62	51	54.20	−11
ε	Serpentis		3.8	15	46	31.660	+2.9883	+ 4	44	9.71	10
ζ	Ursæ Minoris		4.3	15	47	6.299	−2.2056	+78	3	34.34	10
β	Trianguli Australis		3.0	15	47	33.233	+5.2563	−63	9	58.87	11
λ	Libræ		5.1	15	48	20.318	3.4772	−19	54	39.22	10
γ	Serpentis		3.9	15	52	28.797	+2.7696	+15	56	29.86	−11
π	Scorpii		3.0	15	53	38.770	3.6236	−25	52	2.48	10
ε	Coronæ Borealis		4.2	15	54	1.562	2.4823	+27	7	34.51	10
δ	Scorpii		2.5	15	55	14.704	3.5421	−22	22	39.96	10
θ	Draconis		4.1	16	0	16.612	1.1215	+58	47	40.77	9
β	Scorpii	†	2.9	16	0	25.989	+3.4834	−19	34	14.97	−10
κ	Herculis	†	5.3	16	4	11.522	2.7051	+17	16	30.61	9
φ	Herculis		4.3	16	6	3.595	1.8897	+45	9	35.68	9
	Groombridge 2320		5.4	16	6	5.013	0.1524	+68	2	11.51	9
δ¹	Apodis		4.8	16	7	27.156	8.8501	−78	28	51.95	9
δ	Ophiuchi		3.0	16	9	50.232	+3.1414	− 3	28	24.99	− 9
σ	Coronæ Bor. *seq.*	†	5.8	16	11	27.451	+2.2458	+34	4	34.02	9
19	Ursæ Minoris		5.5	16	13	15.660	−1.7496	+76	5	40.08	8
γ²	Normæ		4.1	16	13	23.777	+4.4717	−49	56	44.13	9
ε	Ophiuchi		3.3	16	13	46.155	3.1718	− 4	29	1.08	8
σ	Scorpii	†	3.1	16	15	57.496	+3.6414	−25	23	14.36	− 8
τ	Herculis		3.9	16	17	9.346	1.8031	+46	31	3.44	8
γ	Herculis		3.8	16	18	7.540	+2.6454	+19	21	15.61	8
η	Ursæ Minoris		5.0	16	20	0.111	−1.7916	+75	57	14.21	8
γ	Apodis		3.9	16	20	13.312	+9.0992	−78	42	21.88	8
ω	Herculis		4.5	16	21	26.560	+2.7618	+14	13	50.02	− 8
η	Draconis	†	2.9	16	22	49.466	0.8077	+61	42	31.02	8
α	Scorpii (*Antares*)	†	1.2	16	24	7.900	3.6740	−26	14	31.27	8
β	Herculis		2.8	16	26	31.299	2.5774	+21	40	34.41	7
λ	Ophiuchi	†	3.8	16	26	34.482	+3.0238	+ 2	10	17.00	8
A	Draconis		5.0	16	28	8.713	−0.1301	+68	57	15.20	− 7
τ	Scorpii		2.9	16	30	31.553	+3.7295	−28	2	18.68	7
σ	Herculis		4.2	16	31	19.815	1.9334	+42	36	49.41	7
ζ	Ophiuchi		2.7	16	32	25.292	3.3007	−10	23	37.33	7
24	Scorpii		5.0	16	36	35.819	3.4665	−17	34	35.41	7
ζ	Herculis	†	3.0	16	38	2.634	+2.2613	+31	45	28.75	− 6
α	Trianguli Australis		1.9	16	39	32.784	6.3227	−68	52	16.68	6
η	Herculis		3.6	16	39	56.816	2.0557	+39	5	6.61	6
	Groombridge 2377		4.9	16	43	39.934	1.1372	+56	56	6.98	6
ε	Scorpii		2.4	16	44	35.388	3.8796	−34	8	17.51	6
49	Herculis		6.4	16	48	9.892	+2.7302	+15	7	3.66	− 6
ε¹	Aræ		4.2	16	52	43.434	4.7710	−53	1	46.54	5
κ	Ophiuchi		3.4	16	53	35.800	+2.8382	+ 9	30	28.60	5
ε	Ursæ Minoris		4.4	16	54	44.256	−6.2610	+82	10	49.69	5
30	Ophiuchi		5.0	16	56	31.510	+3.1629	− 4	5	39.92	5
ε	Herculis		3.9	16	56	59.921	+2.2946	+31	3	8.55	− 5
d	Herculis		5.3	16	58	25.780	2.2120	+33	41	31.46	5
η	Ophiuchi	†	2.6	17	5	26.638	+3.4374	−15	37	9.36	− 4

β Scorpii, comp. $5^m.1$, 13″.3 n. f.
κ Herculis, star $6^m.5$, 29″.7 n. f.
σ Cor. Bor. comp. $6^m.7$, 4″.6 s. pr.

σ Scorpii, star 8^m, 21″ pr.
η Draconis, comp. 8^m, 5″.4 s. f.
α Scorpii, comp. 7^m, 3″.2 pr.

λ Ophiuchi, comp. 6^m, 1″ 2
ζ Herculis, binary, $3^m.0$, $6^m.0$
η Oph., binary, $3^m.2$, $3^m.7$, 0

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
η Scorpii . . .	3.4	17	5	59.442	+ 4.2921	−43	7	37.21	−4.986
ζ Draconis . . .	3.2	17	8	32.136	0.1688	+65	49	13.61	4.446
α Herculis . . . †	var.	17	10	43.527	2.7344	+14	29	15.19	4.247
δ Herculis . . . †	3.2	17	11	29.906	2.4631	+24	56	23.70	4.369
π Herculis . . .	3.4	17	12	3.050	2.0884	+36	54	19.62	4.164
59 Apodis (G.) . .	5.9	17	15	21.406	+11.1601	−80	46	54.88	−3.919
θ Ophiuchi . . .	3.4	17	16	43.575	3.6817	−24	54	52.76	3.798
ρ Herculis . . .	5.4	17	17	26.437	2.2429	+32	34	39.51	4.748
β Aræ . . .	2.8	17	18	8.881	4.9807	−55	26	58.82	3.667
b Ophiuchi . . .	4.3	17	21	6.965	3.6608	−24	5	50.14	3.522
σ Ophiuchi . . .	4.4	17	22	14.826	+ 2.9756	+ 4	12	51.71	−3.279
δ Aræ . . .	3.8	17	23	19.820	5.4055	−60	36	49.14	3.314
α Aræ . . .	3.0	17	25	11.474	4.6327	−49	48	32.89	3.116
λ Herculis . . .	4.5	17	27	15.750	2.4240	+26	10	29.25	2.835
λ Scorpii . . .	1.7	17	27	46.020	4.0708	−37	2	31.12	2.837
β Draconis . . .	3.0	17	28	29.330	+ 1.3542	+52	21	52.67	−2.739
α Ophiuchi . . .	2.1	17	30	56.506	2.7837	+12	37	18.43	2.770
ξ Serpentis . . .	3.6	17	32	39.643	3.4329	−15	20	42.68	2.446
ι Herculis . . .	3.8	17	37	2.246	1.6935	+46	3	5.81	2.002
η Pavonis . . .	3.6	17	37	17.275	+ 5.8811	−64	41	2.91	2.063
ω Draconis . . .	4.9	17	37	27.202	− 0.3543	+68	47	51.97	−1.651
β Ophiuchi . . .	2.9	17	39	13.424	+ 2.9629	+ 4	36	8.76	1.657
ι¹ Scorpii . . .	3.1	17	41	34.168	4.1946	−40	5	40.90	1.618
μ Herculis . . .	3.5	17	43	5.531	+ 2.3470	+27	46	13.09	2.227
ψ Draconis . . . †	4.9	17	43	27.881	− 1.0744	+72	11	28.83	1.713
γ Ophiuchi . . .	3.7	17	43	34.791	+ 3.0072	+ 2	44	19.88	−1.508
89 Herculis . . .	5.5	17	51	57.048	2.4207	+26	3	46.83	0.698
ξ Draconis . . .	3.9	17	52	2.570	+ 1.0380	+56	53	9.09	0.619
35 Draconis . . .	5.0	17	53	17.870	− 2.6902	+76	58	29.76	0.343
θ Herculis . . .	4.0	17	53	18.206	+ 2.0570	+37	15	40.65	0.581
ν Ophiuchi . . .	3.5	17	54	17.488	+ 3.3018	− 9	45	50.10	−0.619
ξ Herculis . . .	3.8	17	54	25.383	2.3314	+29	15	23.40	0.505
γ Draconis . . .	2.4	17	54	36.540	1.3925	+51	29	54.83	0.496
67 Ophiuchi . . .	3.9	17	56	20.287	3.0049	+ 2	56	5.64	0.333
θ Aræ . . .	3.9	17	59	56.156	+ 4.6698	−50	5	54.65	−0.056
δ Ursæ Minoris . .	4.4	17	59	59.80*	−19.4981	+86	36	51.16	+0.047
γ Sagittarii . . .	3.1	18	0	16.926	+ 3.8519	−30	25	34.07	−0.173
70 Ophiuchi . . . †	4.1	18	1	6.465	3.0316	+ 2	31	6.93	−1.025
72 Ophiuchi . . .	3.7	18	3	16.318	2.8432	+ 9	33	3.28	+0.373
ο Herculis . . .	3.8	18	4	11.240	2.3394	+28	44	59.83	0.368
χ Octantis . . .	5.2	18	4	24.69*	+35.7374	−87	39	52.84	+0.260
μ Sagittarii . . .	4.0	18	8	37.182	3.5870	−21	4	56.12	0.752
η Sagittarii . . .	3.2	18	11	48.517	4.0597	−36	47	17.81	0.880
Groombridge 2533 .	5.4	18	12	58.254	1.8652	+42	7	46.12	1.132
36 Draconis . . .	5.0	18	13	24.114	0.3456	+64	22	4.71	1.197
δ Sagittarii . . .	2.8	18	15	29.301	+ 3.8406	−29	51	56.32	+1.320
η Serpentis . . .	3.4	18	16	51.539	3.1028	− 2	55	18.81	0.782
ε Sagittarii . . .	2.0	18	18	27.811	+ 3.9815	−34	25	34.06	+1.491

α Herculis, var. irreg., 3m.1–3m.9, dup. comp. 6m, 4″.6 s. f.

δ Herculis, binary, comp. 8m, 12″ s. pr.

ψ Draconis, star 6m.1, 30″.4 n. f.
70 Ophiuchi, comp. 6m, 2″.1 s.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annua Variatio
		h	m	s	s	°	′	″	″
109 Herculis . . .	3.9	18	20	1.973	+ 2.5559	+21	43	47.08	+1.4
α Telescopii . .	3.8	18	20	35.815	+ 4.4500	−46	1	0.90	1.7
χ Draconis . . .	3.7	18	22	36.588	− 1.0785	+72	41	44.61	1.6
λ Sagittarii . .	2.9	18	22	39.803	+ 3.7027	−25	28	13.00	1.7
c Serpentis . .	5.4	18	25	12.430	3.1215	− 2	2	30.29	2.1
1 Aquilæ . . .	4.1	18	30	31.626	+ 3.2646	− 8	18	18.11	+2.3
ζ Pavonis . . .	4.1	18	32	59.375	7.0204	−71	30	12.38	2.7
α Lyræ . (*Vega*)	0.1	18	34	1.601	2.0314	+38	42	10.86	3.2
2 Aquilæ . . .	4.7	18	37	33.958	3.2866	− 9	8	8.47	3.2
φ Sagittarii . .	3.3	18	40	17.018	3.7488	−27	4	48.32	3.4
110 Herculis . . .	4.3	18	41	57.580	+ 2.5803	+20	27	47.58	+3.3
6 Aquilæ . . .	4.5	18	42	36.682	3.1829	− 4	50	26.64	3.6
λ Pavonis . . .	4.4	18	44	15.089	5.5664	−62	17	14.55	3.8
β Lyræ . . . †	*var.*	18	46	54.275	+ 2.2147	+33	15	43.89	4.0
50 Draconis . . .	5.4	18	49	9.344	− 1.9194	+75	19	58.17	4.3
σ Sagittarii . .	2.1	18	49	55.954	+ 3.7201	−26	24	16.45	+4.2
ο Draconis . . . †	4.8	18	49	56.066	0.8882	+59	16	58.67	4.3
θ Serpentis *pr.* . . †	4.5	18	51	56.635	2.9822	+ 4	5	27.15	4.5
R Lyræ . . . †	*var.*	18	52	43.110	1.8260	+43	49	56.24	4.6
ε Aquilæ . . .	4.2	18	55	43.135	2.7221	+14	57	2.48	4.7
γ Lyræ . . .	3.3	18	55	43.567	+ 2.2435	+32	34	15.26	+4.8
ζ Sagittarii . . †	2.7	18	57	8.430	3.8180	−30	0	15.07	4.9
ζ Aquilæ . . .	3.0	19	1	27.427	2.7569	+13	44	5.47	5.21
λ Aquilæ . . .	3.6	19	1	41.100	3.1835	− 5	0	43.97	5.24
α Coronæ Australis .	4.1	19	3	37.308	4.0833	−38	2	22.49	5.37
ι Lyræ . . .	5.1	19	4	13.996	+ 2.1412	+35	57	52.94	+5.53
π Sagittarii . .	3.0	19	4	39.006	+ 3.5689	−21	9	40.27	5.54
λ Ursæ Minoris . .	6.6	19	6	14.74*	−71.3603	+89	0	45.46	5.72
ψ Sagittarii . .	4.9	19	10	16.088	+ 3.6802	−25	24	21.02	6.01
δ Draconis . . .	3.2	19	12	32.348	0.0226	+67	30	36.87	6.32
d Sagittarii . .	5.0	19	12	36.225	+ 3.5110	−19	6	24.58	+6.22
θ Lyræ . . .	4.5	19	13	22.945	2.0808	+37	58	48.23	6.31
ω Aquilæ . . .	5.1	19	13	46.788	2.8159	+11	26	22.40	6.35
κ Cygni . . .	4.0	19	15	6.966	+ 1.3879	+53	12	33.78	6.57
τ Draconis . . .	4.6	19	17	12.945	− 1.1350	+73	11	46.16	6.73
δ Aquilæ . . .	3.4	19	21	9.744	+ 3.0249	+ 2	56	33.09	+7.03
σ Octantis . . .	5.5	19	22	55.65*	96.2590	−89	13	50.44	7.09
β Cygni . . . †	3.2	19	27	15.169	2.4189	+27	46	42.07	7.43
ι Cygni . . .	3.9	19	27	32.296	1.5133	+51	32	46.11	7.60
μ Aquilæ . . .	4.6	19	29	53.320	2.9312	+ 7	11	44.54	7.51
h Sagittarii . .	4.7	19	31	28.500	+ 3.6532	−25	4	27.50	+7.76
κ Aquilæ . . .	5.0	19	32	15.951	3.2289	− 7	13	9.72	7.856
θ Cygni . . .	4.6	19	34	8.137	1.6090	+50	1	17.28	8.255
54 Sagittarii . .	5.4	19	35	47.850	3.4388	−16	29	28.60	8.090
β Sagittæ . . .	4.4	19	37	11.162	2.6939	+17	16	34.01	8.216
15 Cygni . . .	5.0	19	41	10.541	+ 2.1640	+37	8	46.18	+8.605
f Sagittarii . .	5.1	19	41	20.791	3.5016	−19	58	7.05	8.490
γ Aquilæ . . .	2.8	19	42	10.261	+ 2.8520	+10	24	10.55	+8.640

β Lyræ, var., $12^d.9$, $3^m.4$–$4^m.1$, star 7^m, 46″ s. f.
ο Draco., star $7^m.6$, 32″.1 n. pr.

θ Serpentis, star $5^m.4$, 22″.2 s. f.
R Lyræ, var., $46^d.4$, $4^m.0$–$4^m.7$

ζ Sag., binary, $3^m.4$, $3^m.6$, 0″.5
β Cygni, star $5^m.4$, 34″.7 n. f.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
δ Cygni . . . †	3.0	19	42	17.269	+1.8760	+44	55	13.14	+ 8.697
δ Sagittæ . . .	3.8	19	43	33.190	2.6749	+18	19	17.29	8.770
α Aquilæ . (*Altair*)	0.9	19	46	35.243	2.9271	+ 8	38	25.47	9.369
η Aquilæ . . . †	*var.*	19	48	5.549	+3.0568	+ 0	47	3.03	9.100
ε Draconis . . . †	4.0	19	48	28.314	−0.1872	+70	2	55.91	9.164
ι Sagittarii . .	4.2	19	49	19.782	+4.1434	−42	5	42.46	+ 9.249
ε Pavonis . . .	4.1	19	50	39.748	6.9889	−73	8	19.27	9.188
β Aquilæ . . .	3.9	19	51	5.335	2.9468	+ 6	11	28.49	8.860
γ Sagittæ . . .	3.7	19	54	55.929	2.6673	+19	15	28.45	9.661
ζ Sagittarii . .	4.6	19	57	22.328	3.6930	−27	56	59.17	9.837
τ Aquilæ . . .	5.6	19	59	56.343	+2.9308	+ 7	2	5.21	+10.048
θ Aquilæ . . .	3.4	20	6	52.083	3.0960	− 1	4	38.13	10.544
ο Cygni *seq.* . . †	4.0	20	10	55.461	+1.8901	+46	28	48.17	10.844
κ Cephei . . . †	4.4	20	11	48.429	−1.9636	+77	27	10.40	10.929
24 Vulpeculæ . .	5.4	20	13	6.306	+2.5673	+24	24	20.03	10.987
α^2 Capricorni . . †	3.8	20	13	17.055	+3.3305	−12	48	43.62	+11.019
β Capricorni . . †	3.2	20	16	10.880	3.3734	−15	3	13.20	11.229
α Pavonis . . .	2.1	20	18	51.046	4.7649	−57	0	41.86	11.323
γ Cygni . . .	2.3	20	19	8.490	2.1526	+39	58	51.15	11.437
π Capricorni . . †	5.2	20	22	24.005	3.4364	−18	29	39.30	11.667
ρ Capricorni . . †	5.0	20	23	57.416	+3.4247	−18	5	55.31	+11.759
41 Cygni . . .	4.1	20	25	52.943	2.4515	+30	4	51.73	11.914
θ Cephei . . .	4.3	20	28	8.481	1.0119	+62	42	17.07	12.056
ε Delphini . . .	4.0	20	29	6.278	+2.8664	+11	0	37.04	12.116
Groombridge 3241 .	6.4	20	30	23.240	−0.2380	+72	14	25.36	12.211
α Indi . . .	3.2	20	31	31.271	+4.2301	−47	35	32.34	+12.361
β Delphini . . . †	3.7	20	33	31.012	2.8138	+14	17	43.20	12.411
υ Capricorni . .	5.3	20	35	9.351	3.4182	−18	26	31.12	12.551
α Delphini . . .	3.9	20	35	38.627	2.7868	+15	36	29.77	12.608
β Pavonis . . .	3.6	20	37	13.353	5.4444	−66	30	48.01	12.695
α Cygni . (*Deneb*)	1.3	20	38	29.985	+2.0447	+44	58	21.04	+12.782
δ Delphini . . .	4.5	20	39	26.642	2.8008	+14	45	55.18	12.798
ψ Capricorni . .	4.3	20	41	0.382	3.5568	−25	34	49.62	12.805
γ Delphini *seq.* . . †	4.5	20	42	40.098	2.7832	+15	48	49.57	12.867
ε Cygni . . .	2.6	20	42	43.887	2.4274	+33	38	51.29	13.393
ε Aquarii . . .	3.8	20	43	1.306	+3.2494	− 9	48	40.35	+13.056
η Cephei . . .	3.6	20	43	32.553	1.2247	+61	30	16.20	13.941
μ Aquarii . . .	4.8	20	48	0.993	3.2378	− 9	18	24.32	13.376
β Indi . . .	3.7	20	48	5.844	+4.7122	−58	46	45.24	13.411
76 Draconis . . .	5.7	20	48	52.975	−4.1518	+82	12	49.40	13.495
32 Vulpeculæ . .	5.2	20	50	53.669	+2.5562	+27	43	48.08	+13.605
220 Draconis (Heis) .	5.6	20	51	31.610	−2.6251	+80	13	49.51	13.616
ν Cygni . . .	4.0	20	53	57.983	+2.2355	+40	50	7.82	13.779
α Octantis . . .	5.2	20	54	20.274	7.3859	−77	21	11.77	13.430
γ Microscopii . .	4.7	20	56	1.200	3.6868	−32	35	40.34	13.922
θ Capricorni . .	4.2	21	1	6.876	+3.3755	−17	34	31.09	+14.177
ξ Cygni . . .	3.9	21	1	48.130	2.1812	+43	35	3.78	14.294
61 Cygni *pr.* . .	5.6	21	3	2.410	+2.6852	+38	19	33.29	+17.609

δ Cygni, comp. 8^m, $1''.6$ n. pr.
η Aquilæ, var., $7^d.18$, $3^m.7$–$4^m.4$
ε Draconis, comp. $7^m.6$, $3''.1$ n.
ο Cygni, star $5^m.0$ pr. 19^s, $270''$ n., star $7^m.8$ f. $1'$, $96''$ s.
κ Cephei, comp. 8^m, $7''.5$ s. f.
α^2 Capricor., α^1 Capricor., $4^m.6$ pr. 24^s, $137''$ n.
β Capricor., star $6^m.2$ pr. 14^s, $10''$ s.
π Capricor., comp. 9^m, $3''.4$ s. f.
ρ Capricor., comp. $7^m.6$, $2''.8$ s.
β Delphini, binary $4^m.1$, $5^m.4$, $0''.5$
γ Delphini, comp. $5^m.5$, $11''.2$ pr.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
61 Cygni *seq.*	6.3	Δα + 1.553	. . . .	Δδ − 16.06	. . . .
ν Aquarii	4.5	21 4 54.637	+ 3.2701	−11 43 13.44	+14.469
Bradley 2777	5.9	21 7 14.627	− 1.1397	+77 46 40.18	14.645
3 Piscis Australis	5.6	21 8 11.517	+ 3.5636	−27 58 14.56	14.566
ζ Cygni	3.4	21 9 16.519	2.5520	+29 52 24.99	14.675
τ Cygni †	3.8	21 11 21.454	+ 2.3940	+37 40 40.22	+15.293
α Equulei	4.1	21 11 31.508	2.9993	+ 4 53 30.24	14.784
σ Cygni	4.3	21 14 2.237	2.3547	+39 2 2.06	15.018
θ¹ Microscopii	4.9	21 15 15.754	3.8450	−41 10 25.33	15.091
α Cephei	2.6	21 16 31.718	1.4350	+62 13 15.30	15.208
ι Capricorni	4.3	21 17 27.619	+ 3.3442	−17 12 4.98	+15.216
1 Pegasi	4.2	21 18 6.542	2.7740	+19 26 9.75	15.313
γ Pavonis	4.3	21 19 20.870	5.0020	−65 45 22.59	16.103
ζ Capricorni	3.9	21 21 45.602	3.4305	−22 47 3.84	15.474
g Cygni †	5.3	21 26 16.503	2.2126	+46 9 39.69	15.808
β Aquarii	3.1	21 27 1.963	+ 3.1600	− 5 57 0.33	+15.733
β Cephei †	3.3	21 27 33.375	0.7864	+70 10 58.88	15.778
ξ Aquarii	4.8	21 33 10.503	3.1958	− 8 14 25.44	16.048
74 Cygni	5.1	21 33 30.081	2.4033	+40 1 36.21	16.097
γ Capricorni	3.8	21 35 19.695	3.3274	−17 3 4.40	16.165
λ Octantis †	5.4	21 37 50.956	+ 9.5450	−83 6 55.92	+16.299
ε Pegasi	2.5	21 39 57.714	2.9461	+ 9 28 48.72	16.418
11 Cephei	4.8	21 40 39.951	0.8885	+70 54 54.86	16.547
δ Capricorni	3.0	21 42 17.756	3.3142	−16 31 4.99	16.237
π² Cygni	4.3	21 43 36.895	2.2144	+48 54 40.63	16.599
μ Capricorni	5.2	21 48 36.522	+ 3.2732	−13 57 25.96	+16.841
γ Gruis	3.2	21 48 43.492	3.6416	−37 46 11.67	16.825
16 Pegasi	5.0	21 49 8.897	2.7283	+25 31 12.58	16.872
79 Draconis	6.6	21 51 47.091	0.7193	+73 17 42.97	17.005
ε Indi	4.7	21 56 47.276	4.6104	−57 8 23.55	14.644
20 Pegasi	5.7	21 56 53.949	+ 2.9222	+12 42 27.02	+17.169
α Aquarii	3.2	22 1 22.049	3.0821	− 0 44 16.88	17.417
ι Aquarii	4.4	22 1 47.635	3.2426	−14 17 14.54	17.376
20 Cephei	5.4	22 2 23.653	1.8227	+62 21 56.64	17.515
α Gruis	2.2	22 2 49.096	3.7942	−47 22 41.36	17.308
ι Pegasi	4.0	22 3 0.403	+ 2.7914	+24 55 28.66	+17.510
θ Pegasi	3.7	22 5 51.725	3.0267	+ 5 46 27.89	17.646
π Pegasi	4.4	22 6 10.008	2.6626	+32 45 21.03	17.605
ζ Cephei	3.6	22 7 52.131	2.0779	+57 46 37.54	17.704
24 Cephei	5.0	22 8 9.412	1.1579	+71 55 2.49	17.709
θ Aquarii	4.3	22 12 17.793	+ 3.1673	− 8 12 42.70	+17.854
α Tucanæ	2.9	22 12 37.092	4.1357	−60 41 18.61	17.851
υ Octantis	5.7	22 15 31.59*	12.3990	−86 24 21.39	18.073
γ Aquarii	4.0	22 17 12.888	3.0991	− 1 49 15.47	18.079
31 Pegasi	4.9	22 17 17.101	2.9530	+11 46 17.28	18.073
3 Lacertæ	4.6	22 20 10.569	+ 2.3554	+51 47 52.40	+17.986
π Aquarii	4.6	22 20 53.100	3.0638	+ 0 56 26.09	18.199
σ Aquarii	4.9	22 26 5.859	+ 3.1772	−11 7 5.96	+18.361

τ Cygni, comp. 7m, 0″.8
g Cygni, star 6m.7 f. 10s, 420″ s.

β Cephei, star 8m, 13″.3 s. pr.

λ Octantis, binary, 5m.5, 8m.0, 3″.2 n. f.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
α Lacertæ	3.8	22	27	44.795	+2.4679	+49	50	24.06	+18.457
υ Aquarii	5.3	22	29	59.444	3.2852	−21	8	57.19	18.365
226 B. Cephei	5.7	22	30	46.038	1.0652	+75	46	59.37	18.545
η Aquarii	4.1	22	30	56.254	3.0832	− 0	33	39.80	18.498
10 Lacertæ	4.9	22	35	24.036	2.6888	+38	36	8.39	18.684
ε Piscis Australis	4.2	22	35	54.078	+3.3229	−27	29	33.61	+18.700
ζ Pegasi	3.6	22	37	10.351	2.9914	+10	22	55.45	18.737
β Octantis	4.3	22	37	20.057	6.3287	−81	49	58.63	18.758
β Gruis	2.2	22	37	32.252	3.5964	−47	20	5.18	18.736
η Pegasi	3.1	22	38	58.138	2.8091	+29	46	15.74	18.768
λ Pegasi	4.1	22	42	23.222	+2.8869	+23	6	46.07	+18.898
ε Gruis	3.7	22	43	21.921	3.6386	−51	46	9.41	18.877
τ Aquarii	4.2	22	45	2.420	3.1792	−14	2	48.28	18.950
μ Pegasi	3.7	22	45	51.069	2.8931	+24	8	49.93	18.964
ι Cephei	3.7	22	46	36.924	2.1278	+65	44	52.27	18.901
λ Aquarii	3.8	22	48	7.720	+3.1310	− 8	2	15.02	+19.103
ρ Indi	6.1	22	48	41.306	4.2169	−70	32	0.44	19.137
δ Aquarii	3.5	22	50	5.248	3.1864	−16	16	42.40	19.095
α Pisc. Aust. (*Fomalhaut*)	1.3	22	52	54.087	3.3212	−30	4	42.05	19.021
o Andromedæ	3.6	22	57	57.652	2.7544	+41	51	48.77	19.306
β Pegasi †	*var.*	22	59	36.192	+2.9051	+27	36	57.76	+19.488
α Pegasi (*Markab*)	2.6	23	0	28.544	2.9863	+14	44	32.41	19.334
55 Pegasi	4.7	23	2	40.280	3.0208	+ 8	56	40.73	19.409
c^2 Aquarii	3.8	23	4	51.770	3.2021	−21	38	22.18	19.510
π Cephei †	4.6	23	5	9.536	1.8992	+74	55	20.74	19.442
ι Gruis	4.1	23	5	29.702	+3.4075	−45	42	46.05	+19.450
59 Pegasi	5.2	23	7	23.637	3.0278	+ 8	15	10.60	19.524
5 Cassiopeiæ (Heis)	5.6	23	9	8.260	2.8784	+56	41	36.42	19.852
φ Aquarii	4.4	23	9	52.128	3.1072	− 6	30	46.19	19.374
ψ Aquarii †	4.5	23	11	23.232	3.1449	− 9	33	22.76	19.591
γ Tucanæ	4.1	23	12	24.994	+3.5201	−58	42	27.79	+19.676
γ Piscium	3.8	23	12	42.403	3.1094	+ 2	48	44.02	19.641
γ Sculptoris	4.5	23	14	10.950	3.2451	−33	0	2.63	19.580
o Cephei †	4.9	23	15	5.314	2.4513	+67	38	27.02	19.680
τ Pegasi	4.6	23	16	22.688	2.9656	+23	16	9.84	19.672
b^1 Aquarii	4.2	23	18	27.302	+3.1532	−20	34	12.95	+19.628
4 Cassiopeiæ	5.2	23	21	0.640	2.6500	+61	48	37.95	19.746
υ Pegasi	4.6	23	21	5.095	2.9905	+22	55	49.56	19.788
κ Piscium	4.9	23	22	31.433	3.0752	+ 0	47	5.01	19.686
θ Piscium	4.4	23	23	36.292	3.0420	+ 5	54	23.49	19.753
70 Pegasi	4.7	23	24	48.242	+3.0321	+12	17	9.56	+19.845
39 H. Cephei	5.6	23	27	44.908	−0.2516	+86	49	59.29	19.868
β Sculptoris	4.5	23	28	21.782	+3.2249	−38	17	38.99	19.860
72 Pegasi (*mean*) †	5.2	23	29	41.016	2.9708	+30	51	2.28	19.861
λ Andromedæ	4.0	23	33	21.044	2.9279	+45	59	31.74	19.490
ι Andromedæ	4.3	23	33	54.862	+2.9346	+42	47	30.82	+19.916
ι Piscium	4.3	23	35	31.572	3.0844	+ 5	9	36.29	19.495
γ Cephei	3.4	23	35	48.541	+2.4380	+77	9	8.55	+20.091

β Pegasi, var. irreg., $2^m.2$–$2^m.7$
π Cephei, comp. 7^m, 0″.9 f.

ψ Aquarii, star $8^m.5$, 49″.4 n.pr.
o Cephei, comp. 8^m, 2″.9 s. pr.

72 Pegasi, $6^m.0$, $6^m.0$, 0″.4

WASHINGTON, JANUARY $0^d.490$.

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annu Variati
		h	m	s	s	°	′	″	″
κ Andromedæ	4.3	23	36	10.091	+ 2.9471	+43	51	27.40	+19.
ω^2 Aquarii	4.6	23	38	15.805	3.1128	−15	1	13.44	19.
ι^1 Aquarii	5.3	23	39	44.553	3.1145	−18	45	15.81	19.
ψ Andromedæ	5.1	23	41	46.076	2.9634	+45	56	33.67	19.
41 H. Cephei	5.0	23	43	47.422	2.8489	+67	19	43.93	19.
δ Sculptoris	4.6	23	44	26.857	+ 3.1279	−28	36	22.48	+19.
γ^1 Octantis	5.1	23	47	5.581	3.6191	−82	29	48.43	20.
φ Pegasi	5.2	23	48	6.636	3.0480	+18	38	33.46	19.
ρ Cassiopeiæ	4.8	23	50	4.766	2.9812	+57	1	15.40	20.
Groombridge 4163	6.6	23	50	37.823	2.8790	+73	55	54.15	20.
ω Piscium	4.0	23	54	53.659	+ 3.0795	+ 6	23	14.12	+19.
ε Tucanæ	4.7	23	55	27.325	3.1399	−66	3	19.13	20.
30 Piscium	4.7	23	57	32.982	3.0772	− 6	29	31.23	20.
2 Ceti	4.6	23	59	20.113	+ 3.0753	−17	48	53.32	+20.
NORTHERN CIRCUMPOLARS.									
43 H. Cephei	4.5	0	56	46.419	+ 7.6035	+85	47	47.03	+19.4
α Ursæ Minoris (*Polaris*)	2.1	1	28	47.18*	28.2949	+88	50	47.93	18.5
Groombridge 750	6.7	4	9	9.789	17.5638	+85	19	42.36	9.3
Groombridge 944	6.4	5	34	16.491	18.7576	+85	9	23.64	+ 2.2
51 H. Cephei	5.3	7	0	36.40*	29.2609	+87	11	10.74	− 5.2
Groombridge 1119	7.0	8	12	47.195	+60.8844	+88	53	33.49	−10.9
1 H. Draconis	4.6	9	24	55.328	8.8086	+81	42	28.51	15.6
30 H. Camelopardalis	5.3	10	20	42.090	7.5937	+82	59	48.65	18.1
Bradley 1672	6.3	12	14	27.330	+ 0.3543	+88	10	35.93	19.9
Groombridge 2283	7.2	15	4	39.67*	−19.5980	+87	33	52.17	13.8
ε Ursæ Minoris	4.4	16	54	44.256	− 6.2610	+82	10	49.69	− 5.6
δ Ursæ Minoris	4.4	17	59	59.80*	19.4981	+86	36	51.16	+ 0.0
λ Ursæ Minoris	6.6	19	6	14.74*	71.3603	+89	0	45.46	5.7
76 Draconis	5.7	20	48	52.975	4.1518	+82	12	49.40	13.4
39 H. Cephei	5.6	23	27	44.908	− 0.2516	+86	49	59.29	+19.8
SOUTHERN CIRCUMPOLARS.									
4 Octantis (G.)	5.6	1	42	13.66*	− 3.7907	−85	12	15.81	+18.1
31 Mensæ (G.)	6.2	5	46	49.81*	11.6877	−84	49	50.68	+ 1.2
7 Octantis (G.)	6.4	7	17	21.00*	20.1981	−86	53	46.93	− 6.6
ζ Octantis	5.4	9	9	22.33*	8.1044	−85	19	13.38	14.7
η Octantis	6.3	10	59	56.35*	− 0.3529	−84	7	52.51	19.3
ι Octantis	5.4	12	45	49.27*	+ 5.9467	−84	39	23.48	−19.6
δ Octantis	4.1	14	13	0.04*	9.2358	−83	16	30.72	−16.77
χ Octantis	5.2	18	4	24.69*	35.7374	−87	39	52.84	+ 0.26
σ Octantis	5.5	19	22	55.65*	96.2590	−89	13	50.44	7.09
υ Octantis	5.7	22	15	31.59*	+12.3990	−86	24	21.39	+18.07

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			***α* Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	0 56	+85 48	Jan.	1 28	+88 51	Jan.	4 9	+85 20	Jan.	5 34	+85 9	Jan.	7 1	+87 11
	s	″		s	″		s	″		s	″		s	″
✓ 0.3	41.24	10.81	0.3	38.89	12.45	0.4	21.38	2.66	0.5	32.79	37.58	0.5	9.32	16.30
1.3	40.94	10.88	1.3	37.77	12.56	1.4	21.24	2.96	1.5	32.75	37.92	1.5	9.43	16.64
2.3	40.64	10.93	2.3	36.67	12.65	2.4	21.09	3.24	2.4	32.70	38.24	2.5	9.53	16.96
3.3	40.36	10.97	3.3	35.61	12.73	3.4	20.94	3.50	3.4	32.64	38.55	3.5	9.61	17.27
4.3	40.08	10.99	4.3	34.60	12.81	4.4	20.80	3.74	4.4	32.59	38.84	4.5	9.68	17.57
5.2	39.81	11.01	5.3	33.64	12.88	5.4	20.67	3.97	5.4	32.55	39.11	5.5	9.74	17.86
6.2	39.57	11.04	6.3	32.72	12.96	6.4	20.55	4.20	6.4	32.51	39.37	6.5	9.81	18.14
7.2	39.33	11.08	7.3	31.82	13.05	7.4	20.44	4.43	7.4	32.48	39.64	7.5	9.90	18.41
8.2	39.09	11.13	8.3	30.92	13.14	8.4	20.33	4.67	8.4	32.46	39.92	8.5	10.01	18.69
9.2	38.83	11.18	9.3	29.99	13.25	9.4	20.22	4.93	9.4	32.44	40.21	9.5	10.13	18.98
✓ 10.2	38.55	11.25	10.3	29.01	13.37	10.4	20.11	5.22	10.4	32.43	40.52	10.5	10.26	19.29
11.2	38.26	11.32	11.3	27.96	13.49	11.4	19.98	5.51	11.4	32.40	40.85	11.5	10.38	19.61
12.2	37.95	11.38	12.3	26.83	13.60	12.4	19.84	5.81	12.4	32.36	41.20	12.5	10.48	19.96
13.2	37.62	11.42	13.2	25.63	13.69	13.4	19.67	6.10	13.4	32.30	41.55	13.5	10.55	20.33
14.2	37.29	11.42	14.2	24.41	13.75	14.4	19.48	6.37	14.4	32.21	41.89	14.5	10.58	20.70
15.2	36.96	11.39	15.2	23.20	13.79	15.4	19.28	6.62	15.4	32.10	42.21	15.5	10.57	21.06
16.2	36.65	11.34	16.2	22.04	13.80	16.4	19.08	6.84	16.4	31.99	42.51	16.5	10.53	21.40
17.2	36.36	11.28	17.2	20.96	13.78	17.3	18.88	7.02	17.4	31.87	42.78	17.5	10.47	21.71
18.2	36.10	11.21	18.2	19.96	13.76	18.3	18.69	7.19	18.4	31.75	43.02	18.5	10.41	22.01
19.2	35.86	11.15	19.2	19.03	13.75	19.3	18.52	7.36	19.4	31.65	43.25	19.5	10.37	22.28
✓ 20.2	35.63	11.11	20.2	18.13	13.75	20.3	18.37	7.53	20.4	31.56	43.48	20.5	10.35	22.54
21.2	35.40	11.07	21.2	17.22	13.76	21.3	18.22	7.70	21.4	31.49	43.72	21.5	10.34	22.81
22.2	35.15	11.05	22.2	16.28	13.79	22.3	18.07	7.90	22.4	31.42	43.97	22.5	10.35	23.09
23.2	34.88	11.04	23.2	15.29	13.82	23.3	17.91	8.12	23.4	31.33	44.24	23.5	10.36	23.39
24.2	34.59	11.02	24.2	14.22	13.85	24.3	17.73	8.35	24.4	31.24	44.54	24.4	10.36	23.71
25.2	34.29	10.98	25.2	13.07	13.87	25.3	17.53	8.57	25.4	31.12	44.85	25.4	10.33	24.06
26.2	33.98	10.92	26.2	11.89	13.87	26.3	17.31	8.78	26.4	30.99	45.15	26.4	10.27	24.41
27.2	33.66	10.84	27.2	10.70	13.84	27.3	17.07	8.98	27.4	30.85	45.44	27.4	10.17	24.76
28.2	33.35	10.73	28.2	9.51	13.79	28.3	16.82	9.17	28.4	30.69	45.72	28.4	10.04	25.10
29.2	33.06	10.60	29.2	8.35	13.71	29.3	16.58	9.33	29.4	30.52	45.98	29.4	9.90	25.43
✓ 30.2	32.77	10.46	30.2	7.25	13.62	30.3	16.34	9.47	30.4	30.34	46.21	30.4	9.73	25.74
31.2	32.50	10.31	31.2	6.20	13.52	31.3	16.09	9.58	31.4	30.16	46.42	31.4	9.55	26.03
32.2	32.26	10.16	32.2	5.22	13.41	32.3	15.86	9.68	32.4	29.98	46.62	32.4	9.37	26.31
	13.66	+13.63		49.99	+49.99		12.30	+12.26		11.86	+11.81		20.39	+20.37
	0h 56m	46s.419		1h 28m	47s.18		4h 9m	9s.789		5h 34m	16s.491		7h 0m	36s.40
	+85° 47′	47″.03		+88° 50′	47″.93		+85° 19′	42″.36		+85° 9′	23″.64		+87° 11′	10″.74

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	D na *N*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	
Feb.	0 56	+85 48	Feb.	1 27	+88 51	Feb.	4 9	+85 20	Feb.	5 34	+85 9	Feb.	7 1	+8
	s	″		s	″		s	″		s	″		s	
1.2	32.26	10.16	1.2	65.22	13.41	1.3	15.86	9.68	1.4	29.98	46.62	1.4	9.37	26
2.2	32.03	10.01	2.2	64.29	13.30	2.3	15.65	9.77	2.4	29.81	46.80	2.4	9.19	26
3.2	31.81	9.87	3.2	63.40	13.20	3.3	15.44	9.87	3.4	29.65	46.98	3.4	9.03	26
4.2	31.59	9.74	4.2	62.54	13.11	4.3	15.24	9.97	4.4	29.50	47.17	4.4	8.89	27
5.2	31.37	9.62	5.2	61.66	13.04	5.3	15.04	10.08	5.4	29.36	47.36	5.4	8.76	27
6.2	31.14	9.51	6.2	60.73	12.98	6.3	14.84	10.21	6.4	29.22	47.57	6.4	8.65	27
7.2	30.89	9.41	7.2	59.76	12.92	7.3	14.63	10.36	7.4	29.07	47.80	7.4	8.53	27
8.2	30.62	9.30	8.2	58.73	12.85	8.3	14.41	10.51	8.3	28.91	48.05	8.4	8.40	28
✓ 9.2	30.34	9.17	9.2	57.64	12.77	9.3	14.16	10.65	9.3	28.74	48.30	9.4	8.24	28
10.2	30.05	9.02	10.2	56.52	12.67	10.3	13.91	10.78	10.3	28.55	48.54	10.4	8.04	28
11.1	29.77	8.84	11.2	55.41	12.54	11.3	13.64	10.89	11.3	28.35	48.76	11.4	7.81	29
12.1	29.51	8.64	12.2	54.34	12.38	12.3	13.36	10.96	12.3	28.13	48.96	12.4	7.55	29
13.1	29.28	8.42	13.2	53.35	12.20	13.3	13.09	11.01	13.3	27.90	49.13	13.4	7.27	29
14.1	29.06	8.20	14.2	52.45	12.01	14.3	12.83	11.03	14.3	27.67	49.26	14.4	6.99	29
15.1	28.87	7.97	15.2	51.64	11.82	15.3	12.59	11.03	15.3	27.46	49.37	15.4	6.71	30
16.1	28.70	7.76	16.2	50.90	11.64	16.3	12.37	11.04	16.3	27.27	49.48	16.4	6.45	30
17.1	28.53	7.57	17.2	50.18	11.48	17.3	12.16	11.06	17.3	27.09	49.59	17.4	6.21	30.
18.1	28.36	7.38	18.1	49.44	11.33	18.3	11.95	11.09	18.3	26.91	49.72	18.4	6.00	30.
✓ 19.1	28.17	7.21	19.1	48.66	11.19	19.3	11.73	11.14	19.3	26.73	49.87	19.4	5.79	30.
20.1	27.97	7.04	20.1	47.82	11.06	20.3	11.51	11.21	20.3	26.55	50.02	20.4	5.58	31.
21.1	27.75	6.86	21.1	46.92	10.93	21.3	11.27	11.28	21.3	26.36	50.19	21.4	5.34	31.
22.1	27.52	6.66	22.1	45.96	10.77	22.3	11.01	11.33	22.3	26.14	50.37	22.4	5.08	31.
23.1	27.28	6.44	23.1	44.99	10.58	23.2	10.73	11.36	23.3	25.91	50.53	23.4	4.78	31.
24.1	27.05	6.19	24.1	44.04	10.37	24.2	10.45	11.38	24.3	25.66	50.67	24.4	4.46	32.
25.1	26.84	5.93	25.1	43.13	10.15	25.2	10.16	11.38	25.3	25.41	50.80	25.4	4.11	32.
26.1	26.64	5.65	26.1	42.28	9.90	26.2	9.88	11.36	26.3	25.16	50.91	26.4	3.74	32.
27.1	26.47	5.35	27.1	41.49	9.65	27.2	9.60	11.32	27.3	24.90	50.99	27.4	3.36	32.
28.1	26.31	5.06	28.1	40.77	9.39	28.2	9.34	11.26	28.3	24.65	51.05	28.4	2.99	33.
29.1	26.16	4.78	29.1	40.11	9.12	29.2	9.10	11.19	29.3	24.40	51.09	29.4	2.63	33.
30.1	26.03	4.50	30.1	39.51	8.86	30.2	8.86	11.11	30.3	24.16	51.12	30.3	2.27	33.3
	13.66	+13.62		49.97	+49.96		12.30	+12.26		11.86	+11.82		20.41	+20.3
	$0^h\ 56^m$	$46^s.419$		$1^h\ 28^m$	$47^s.18$		$4^h\ 9^m$	$9^s.789$		$5^h\ 34^m$	$16^s.491$		$7^h\ 0^m$	$36^s.4$
	+85° 47′	47″.03		+88° 50′	47″.93		+85° 19′	42″.36		+85° 9′	23″.64		+87° 11′	10″.7

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Datè.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	0 56	+85 47	Mar.	1 27	+88 51	Mar.	4 9	+85 20	Mar.	5 34	+85 9	Mar.	7 0	+87 11
	s	″		s	″		s	″		s	″		s	″
✓ 1.1	26.16	64.78	1.1	40.11	9.12	1.2	9.10	11.19	1.3	24.40	51.09	1.4	62.63	33.24
2.1	26.03	64.50	2.1	39.51	8.86	2.2	8.86	11.11	2.3	24.16	51.12	2.3	62.27	33.39
3.1	25.91	64.24	3.1	38.95	8.63	3.2	8.63	11.04	3.3	23.94	51.16	3.3	61.94	33.53
4.1	25.80	64.00	4.1	38.41	8.41	4.2	8.41	10.97	4.3	23.73	51.20	4.3	61.62	33.67
5.1	25.68	63.76	5.1	37.85	8.20	5.2	8.20	10.92	5.3	23.53	51.25	5.3	61.31	33.81
6.1	25.55	63.53	6.1	37.25	7.99	6.2	7.99	10.88	6.3	23.32	51.31	6.3	61.01	33.97
7.1	25.41	63.30	7.1	36.59	7.79	7.2	7.76	10.85	7.3	23.10	51.39	7.3	60.71	34.14
8.1	25.25	63.07	8.1	35.87	7.59	8.2	7.52	10.83	8.3	22.88	51.48	8.3	60.40	34.33
9.1	25.08	62.82	9.1	35.12	7.37	9.2	7.27	10.80	9.3	22.65	51.57	9.3	60.06	34.53
10.1	24.91	62.54	10.1	34.37	7.11	10.2	7.00	10.75	10.3	22.40	51.64	10.3	59.68	34.72
✓ 11.1	24.76	62.24	11.1	33.67	6.83	11.2	6.73	10.69	11.3	22.13	51.69	11.3	59.28	34.89
12.1	24.63	61.91	12.1	33.05	6.54	12.2	6.46	10.59	12.3	21.86	51.72	12.3	58.85	35.04
13.1	24.52	61.58	13.1	32.53	6.23	13.2	6.20	10.45	13.3	21.59	51.72	13.3	58.42	35.16
14.1	24.45	61.25	14.1	32.10	5.92	14.2	5.96	10.29	14.3	21.33	51.68	14.3	57.99	35.25
15.1	24.40	60.94	15.1	31.75	5.62	15.2	5.74	10.13	15.3	21.09	51.62	15.3	57.57	35.31
16.1	24.36	60.65	16.1	31.46	5.33	16.2	5.54	9.97	16.2	20.87	51.56	16.3	57.19	35.36
17.1	24.33	60.38	17.1	31.18	5.07	17.2	5.36	9.82	17.2	20.66	51.52	17.3	56.84	35.42
18.1	24.28	60.12	18.1	30.86	4.83	18.2	5.18	9.69	18.2	20.46	51.49	18.3	56.49	35.49
19.0	24.21	59.87	19.1	30.48	4.59	19.2	4.99	9.59	19.2	20.25	51.46	19.3	56.15	35.58
20.0	24.12	59.62	20.1	30.06	4.34	20.2	4.78	9.50	20.2	20.04	51.46	20.3	55.81	35.68
✓ 21.0	24.03	59.35	21.1	29.59	4.09	21.2	4.56	9.41	21.2	19.82	51.48	21.3	55.45	35.79
22.0	23.95	59.06	22.1	29.10	3.82	22.2	4.33	9.30	22.2	19.58	51.48	22.3	55.06	35.91
23.0	23.86	58.75	23.1	28.61	3.53	23.2	4.09	9.17	23.2	19.32	51.47	23.3	54.64	36.02
24.0	23.78	58.43	24.1	28.16	3.22	24.2	3.84	9.02	24.2	19.05	51.44	24.3	54.19	36.12
25.0	23.72	58.09	25.1	27.77	2.89	25.2	3.60	8.85	25.2	18.79	51.39	25.3	53.72	36.20
26.0	23.68	57.74	26.1	27.44	2.55	26.2	3.36	8.65	26.2	18.53	51.31	26.3	53.25	36.25
27.0	23.66	57.40	27.0	27.19	2.20	27.2	3.14	8.43	27.2	18.27	51.21	27.3	52.79	36.28
28.0	23.66	57.06	28.0	27.02	1.86	28.2	2.93	8.21	28.2	18.02	51.10	28.3	52.33	36.30
29.0	23.67	56.72	29.0	26.92	1.54	29.2	2.74	7.98	29.2	17.78	50.98	29.3	51.89	36.29
30.0	23.69	56.40	30.0	26.86	1.22	30.2	2.56	7.75	30.2	17.56	50.85	30.3	51.47	36.27
✓ 31.0	23.72	56.09	31.0	26.81	0.91	31.1	2.40	7.53	31.2	17.35	50.72	31.3	51.06	36.25
32.0	23.75	55.80	32.0	26.76	0.62	32.1	2.24	7.33	32.2	17.16	50.61	32.3	50.68	36.23
	13.65	+13.62		49.89	+49.88		12.30	+12.26		11.86	+11.82		20.42	+20.40
	$0^h\ 56^m$	$46^s.419$		$1^h\ 28^m$	$47^s.18$		$4^h\ 9^m$	$9^s.789$		$5^h\ 34^m$	$16^s.491$		$7^h\ 0^m$	$36^s.40$
	+85° 47′	47″.03		+88° 50′	47″.93		+85° 19′	42″.36		+85° 9′	23″.64		+87° 11′	10″.74

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON

43 H. Cephei. Mag. 4.5			*α* **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	0 56	+85 47	Apr.	1 27	+88 50	Apr.	4 8	+85 19	Apr.	5 34	+85 9	Apr.	7 0	+87 11
	s	″		s	″		s	″		s	″		s	″
1.0	23.75	55.80	1.0	26.76	60.62	1.1	62.24	67.33	1.2	17.16	50.61	1.3	50.68	36.23
2.0	23.77	55.53	2.0	26.69	60.36	2.1	62.09	67.15	2.2	16.97	50.50	2.3	50.32	36.23
3.0	23.78	55.28	3.0	26.58	60.09	3.1	61.94	66.98	3.2	16.78	50.41	3.3	49.97	36.24
4.0	23.78	55.02	4.0	26.42	59.83	4.1	61.77	66.82	4.2	16.58	50.33	4.3	49.61	36.26
5.0	23.76	54.74	5.0	26.22	59.56	5.1	61.59	66.65	5.2	16.37	50.26	5.3	49.23	36.30
5.9	23.74	54.44	6.0	26.01	59.27	6.1	61.40	66.46	6.2	16.15	50.18	6.3	48.83	36.33
6.9	23.73	54.13	7.0	25.83	58.96	7.1	61.20	66.26	7.2	15.91	50.08	7.2	48.40	36.35
7.9	23.74	53.80	8.0	25.71	58.63	8.1	61.01	66.04	8.2	15.67	49.95	8.2	47.94	36.34
8.9	23.78	53.46	9.0	25.69	58.28	9.1	60.84	65.78	9.2	15.43	49.80	9.2	47.48	36.30
9.9	23.85	53.12	10.0	25.78	57.93	10.1	60.68	65.51	10.2	15.21	49.61	10.2	47.02	36.23
10.9	23.95	52.79	11.0	25.96	57.59	11.1	60.54	65.22	11.2	15.01	49.40	11.2	46.58	36.14
11.9	24.06	52.49	12.0	26.20	57.26	12.1	60.42	64.93	12.2	14.82	49.19	12.2	46.18	36.04
12.9	24.18	52.21	13.0	26.45	56.97	13.1	60.32	64.66	13.2	14.65	48.99	13.2	45.81	35.93
13.9	24.28	51.95	13.9	26.71	56.70	14.1	60.23	64.41	14.2	14.50	48.80	14.2	45.46	35.83
14.9	24.37	51.71	14.9	26.94	56.44	15.1	60.14	64.18	15.2	14.34	48.63	15.2	45.12	35.74
15.9	24.45	51.46	15.9	27.09	56.19	16.1	60.03	63.96	16.2	14.18	48.48	16.2	44.78	35.67
16.9	24.52	51.21	16.9	27.19	55.93	17.1	59.91	63.75	17.2	14.02	48.35	17.2	44.43	35.62
17.9	24.58	50.95	17.9	27.25	55.66	18.1	59.78	63.53	18.2	13.84	48.21	18.2	44.07	35.58
18.9	24.64	50.67	18.9	27.31	55.36	19.1	59.65	63.30	19.2	13.65	48.05	19.2	43.68	35.53
19.9	24.71	50.37	19.9	27.40	55.05	20.1	59.51	63.06	20.2	13.45	47.88	20.2	43.27	35.47
20.9	24.79	50.06	20.9	27.55	54.73	21.1	59.37	62.79	21.2	13.25	47.70	21.2	42.84	35.39
21.9	24.89	49.74	21.9	27.75	54.40	22.1	59.24	62.50	22.1	13.05	47.50	22.2	42.40	35.29
22.9	25.02	49.43	22.9	28.02	54.06	23.1	59.12	62.19	23.1	12.85	47.28	23.2	41.96	35.17
23.9	25.17	49.12	23.9	28.37	53.73	24.1	59.02	61.88	24.1	12.66	47.03	24.2	41.54	35.03
24.9	25.33	48.82	24.9	28.79	53.40	25.1	58.93	61.56	25.1	12.50	46.77	25.2	41.14	34.88
25.9	25.49	48.54	25.9	29.26	53.09	26.1	58.86	61.24	26.1	12.35	46.51	26.2	40.76	34.71
26.9	25.67	48.28	26.9	29.77	52.81	27.1	58.80	60.93	27.1	12.21	46.26	27.2	40.40	34.53
27.9	25.86	48.04	27.9	30.29	52.54	28.1	58.76	60.64	28.1	12.09	46.00	28.2	40.07	34.35
28.9	26.03	47.81	28.9	30.78	52.28	29.1	58.73	60.37	29.1	11.98	45.76	29.2	39.76	34.19
29.9	26.18	47.60	29.9	31.22	52.04	30.1	58.70	60.11	30.1	11.87	45.54	30.2	39.47	34.03
30.9	26.32	47.39	30.9	31.61	51.81	31.1	58.66	59.86	31.1	11.77	45.34	31.2	39.18	33.89
31.9	26.45	47.18	31.9	31.95	51.58	32.1	58.60	59.62	32.1	11.65	45.15	32.2	38.88	33.76
13.65		+13.61	49.78		+49.77	12.30		+12.25	11.86		+11.82	20.42		+20.40
$0^h\ 56^m$		$46^s.419$	$1^h\ 28^m$		$47^s.18$	$4^h\ 9^m$		$9^s.789$	$5^h\ 34^m$		$16^s.491$	$7^h\ 0^m$		$36^s.40$
+85° 47′		47″.03	+88° 50′		47″.93	+85° 19′		42″.36	+85° 9′		23″.64	+87° 11′		10″.74

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	0 56	+85 47	May	1 27	+88 50	May	4 8	+85 19	May	5 34	+85 9	May	7 0	+87 11
	s	″		s	″		s	″		s	″		s	″
1.9	26.45	47.18	1.9	31.95	51.58	1.1	58.66	59.86	1.1	11.77	45.34	1.2	39.18	33.89
2.9	26.57	46.96	2.9	32.28	51.33	2.1	58.60	59.62	2.1	11.65	45.15	2.2	38.88	33.76
3.9	26.70	46.71	3.9	32.62	51.06	3.1	58.54	59.38	3.1	11.52	44.95	3.2	38.56	33.64
4.9	26.84	46.45	4.9	33.00	50.78	4.1	58.47	59.12	4.1	11.38	44.73	4.2	38.22	33.52
5.9	27.01	46.18	5.9	33.47	50.48	5.1	58.39	58.83	5.1	11.23	44.50	5.2	37.85	33.38
6.9	27.21	45.91	6.9	34.03	50.18	6.1	58.32	58.52	6.1	11.08	44.25	6.2	37.47	33.20
7.9	27.43	45.65	7.9	34.69	49.89	7.0	58.28	58.19	7.1	10.94	43.97	7.2	37.11	33.00
8.9	27.67	45.42	8.9	35.43	49.62	8.0	58.27	57.85	8.1	10.82	43.67	8.2	36.75	32.77
✓ 9.9	27.92	45.21	9.9	36.21	49.37	9.0	58.27	57.51	9.1	10.72	43.35	9.2	36.45	32.52
10.9	28.17	45.02	10.9	36.98	49.15	10.0	58.29	57.18	10.1	10.65	43.04	10.2	36.17	32.26
11.9	28.40	44.86	11.9	37.72	48.95	11.0	58.32	56.88	11.1	10.59	42.74	11.2	35.92	32.02
12.9	28.61	44.71	12.9	38.40	48.76	12.0	58.36	56.60	12.1	10.54	42.46	12.2	35.69	31.78
13.9	28.81	44.55	13.9	39.02	48.57	13.0	58.39	56.34	13.1	10.50	42.21	13.2	35.48	31.56
14.9	29.00	44.38	14.9	39.60	48.38	14.0	58.41	56.08	14.1	10.45	41.98	14.1	35.26	31.36
15.9	29.18	44.20	15.9	40.14	48.17	15.0	58.42	55.83	15.1	10.38	41.75	15.1	35.03	31.18
16.9	29.36	44.01	16.9	40.69	47.94	16.0	58.42	55.57	16.1	10.30	41.51	16.1	34.77	31.00
17.9	29.56	43.81	17.9	41.28	47.70	17.0	58.41	55.30	17.1	10.20	41.26	17.1	34.49	30.81
18.9	29.78	43.59	18.9	41.94	47.45	18.0	58.41	55.00	18.1	10.11	40.99	18.1	34.20	30.61
✓ 19.9	30.02	43.38	19.9	42.66	47.20	19.0	58.41	54.69	19.1	10.02	40.71	19.1	33.90	30.40
20.9	30.27	43.18	20.9	43.45	46.96	20.0	58.42	54.37	20.1	9.94	40.41	20.1	33.60	30.16
21.9	30.54	42.98	21.9	44.30	46.72	21.0	58.45	54.03	21.1	9.86	40.09	21.1	33.31	29.90
22.9	30.83	42.80	22.9	45.21	46.50	22.0	58.49	53.69	22.1	9.80	39.76	22.1	33.04	29.62
23.9	31.12	42.64	23.9	46.14	46.29	23.0	58.55	53.36	23.1	9.76	39.43	23.1	32.80	29.33
24.9	31.40	42.51	24.9	47.08	46.11	24.0	58.62	53.04	24.1	9.74	39.10	24.1	32.59	29.04
25.9	31.68	42.39	25.9	48.01	45.95	24.9	58.70	52.73	25.1	9.73	38.78	25.1	32.40	28.74
26.9	31.95	42.29	26.9	48.90	45.80	25.9	58.80	52.44	26.1	9.73	38.47	26.1	32.24	28.45
27.9	32.20	42.20	27.9	49.74	45.67	26.9	58.91	52.17	27.1	9.74	38.19	27.1	32.10	28.18
28.9	32.44	42.11	28.9	50.52	45.55	27.9	59.01	51.92	28.1	9.75	37.92	28.1	31.97	27.92
✓ 29.9	32.66	42.02	29.9	51.26	45.41	28.9	59.09	51.68	29.0	9.76	37.66	29.1	31.83	27.69
30.8	32.88	41.91	30.9	51.98	45.24	29.9	59.17	51.45	30.0	9.75	37.41	30.1	31.68	27.47
31.8	33.11	41.78	31.9	52.73	45.07	30.9	59.23	51.20	31.0	9.74	37.16	31.1	31.51	27.24
32.8	33.36	41.64	32.9	53.55	44.89	31.9	59.28	50.93	32.0	9.71	36.89	32.1	31.32	26.99
	13.64	+13.60		49.68	+49.67		12.29	+12.25		11.85	+11.81		20.41	+20.39
	0h 56m	46s.419		1h 28m	47s.18		4h 9m	9s.789		5h 34m	16s.491		7h 0m	36s.40
	+85° 47′	47″.03		+88° 50′	47″.93		+85° 19	42″.36		+85° 9′	23″.64		+87° 11′	10″.74

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	0 56	+85 47	June	1 27	+88 50	June	4 8	+85 19	June	5 34	+85 9	June	7 0	+87 11
	s	″		s	″		s	″		s	″		s	″
1.8	33.36	41.64	1.9	53.55	44.89	1.9	59.35	50.64	1.0	9.71	36.89	1.1	31.32	26.99
2.8	33.64	41.49	2.9	54.44	44.69	2.9	59.43	50.33	2.0	9.69	36.59	2.1	31.11	26.73
3.8	33.95	41.35	3.9	55.44	44.50	3.9	59.53	50.00	3.0	9.67	36.27	3.1	30.91	26.45
4.8	34.27	41.24	4.9	56.53	44.33	4.9	59.66	49.68	4.0	9.67	35.93	4.1	30.73	26.13
5.8	34.60	41.16	5.9	57.66	44.20	5.9	59.82	49.37	5.0	9.69	35.58	5.1	30.58	25.79
6.8	34.94	41.10	6.9	58.79	44.09	6.9	59.98	49.08	6.0	9.73	35.23	6.1	30.47	25.45
7.8	35.26	41.07	7.8	59.89	44.01	7.9	60.15	48.81	7.0	9.79	34.90	7.1	30.39	25.12
8.8	35.55	41.05	8.8	60.93	43.95	8.9	60.31	48.57	8.0	9.86	34.58	8.1	30.33	24.79
9.8	35.83	41.03	9.8	61.91	43.89	9.9	60.47	48.35	9.0	9.94	34.29	9.1	30.30	24.48
10.8	36.10	41.01	10.8	62.83	43.83	10.9	60.61	48.14	10.0	10.02	34.01	10.1	30.27	24.19
11.8	36.36	40.98	11.8	63.70	43.76	11.9	60.75	47.92	11.0	10.08	33.75	11.1	30.23	23.92
12.8	36.62	40.94	12.8	64.56	43.67	12.9	60.87	47.69	12.0	10.13	33.50	12.1	30.17	23.67
13.8	36.88	40.88	13.8	65.44	43.56	13.9	60.99	47.44	13.0	10.18	33.24	13.1	30.09	23.40
14.8	37.16	40.81	14.8	66.36	43.44	14.9	61.12	47.18	14.0	10.22	32.97	14.1	30.00	23.13
15.8	37.45	40.74	15.8	67.35	43.32	15.9	61.25	46.92	15.0	10.25	32.68	15.1	29.90	22.85
16.8	37.76	40.68	16.8	68.39	43.21	16.9	61.39	46.63	15.9	10.29	32.37	16.1	29.80	22.54
17.8	38.08	40.62	17.8	69.49	43.10	17.9	61.55	46.34	16.9	10.34	32.05	17.1	29.71	22.22
18.8	38.41	40.58	18.8	70.64	43.01	18.9	61.73	46.06	17.9	10.40	31.72	18.1	29.63	21.88
19.8	38.75	40.56	19.8	71.83	42.94	19.9	61.92	45.79	18.9	10.46	31.39	19.0	29.57	21.53
20.8	39.09	40.56	20.8	73.02	42.89	20.9	62.13	45.54	19.9	10.55	31.05	20.0	29.54	21.18
21.8	39.42	40.58	21.8	74.20	42.86	21.9	62.35	45.30	20.9	10.66	30.73	21.0	29.54	20.83
22.8	39.75	40.63	22.8	75.34	42.85	22.9	62.57	45.09	21.9	10.79	30.42	22.0	29.57	20.48
23.8	40.06	40.69	23.8	76.43	42.86	23.9	62.78	44.89	22.9	10.93	30.13	23.0	29.63	20.15
24.8	40.34	40.75	24.8	77.46	42.86	24.9	62.99	44.71	23.9	11.07	29.86	24.0	29.71	19.84
25.8	40.61	40.81	25.8	78.43	42.87	25.9	63.18	44.54	24.9	11.20	29.60	25.0	29.78	19.55
26.8	40.88	40.85	26.8	79.36	42.86	26.9	63.36	44.36	25.9	11.33	29.36	26.0	29.84	19.27
27.8	41.14	40.88	27.8	80.30	42.85	27.9	63.53	44.18	26.9	11.44	29.13	27.0	29.89	18.99
28.8	41.42	40.90	28.8	81.29	42.81	28.9	63.71	43.98	27.9	11.54	28.89	28.0	29.92	18.72
29.8	41.73	40.90	29.8	82.34	42.77	29.9	63.89	43.75	28.9	11.63	28.63	29.0	29.92	18.43
30.8	42.05	40.91	30.8	83.47	42.73	30.9	64.09	43.50	29.9	11.73	28.34	30.0	29.92	18.11
31.8	42.39	40.94	31.8	84.68	42.70	31.9	64.32	43.25	30.9	11.84	28.02	31.0	29.93	17.77
32.8	42.74	41.00	32.8	85.95	42.69	32.9	64.57	43.01	31.9	11.97	27.69	32.0	29.97	17.41
	13.64	+13.60		49.63	+49.62		12.28	+12.24		11.85	+11.81		20.40	+20.37
	$0^{h}\ 56^{m}$	$46^{s}.419$		$1^{h}\ 28^{m}$	$47^{s}.18$		$4^{h}\ 9^{m}$	$9^{s}.789$		$5^{h}\ 34^{m}$	$16^{s}.491$		$7^{h}\ 0^{m}$	$36^{s}.40$
	+85° 47′	47″.03		+88° 50′	47″.93		+85° 19′	42″.36		+85° 9′	23″.64		+87° 11′	10″.74

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			***α* Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	0 56	+85 47	July	1 28	+88 50	July	4 9	+85 19	July	5 34	+85 9	July	7 0	+87 11
	s	″		s	″		s	″		s	″		s	″
1.8	42.39	40.94	1.8	24.68	42.70	1.9	4.32	43.25	1.9	11.97	27.69	1.0	29.93	17.77
2.8	42.74	41.00	2.8	25.95	42.69	2.9	4.57	43.01	2.9	12.12	27.37	2.0	29.97	17.41
3.8	43.09	41.08	3.8	27.24	42.70	3.9	4.84	42.79	3.9	12.30	27.06	3.0	30.04	17.03
4.8	43.44	41.19	4.8	28.50	42.75	4.9	5.11	42.60	4.9	12.49	26.77	4.0	30.15	16.66
5.8	43.77	41.32	5.8	29.70	42.82	5.9	5.38	42.43	5.9	12.68	26.50	5.0	30.30	16.30
6.7	44.08	41.46	6.8	30.83	42.91	6.9	5.65	42.29	6.9	12.88	26.26	6.0	30.47	15.97
7.7	44.37	41.59	7.8	31.90	43.00	7.9	5.90	42.16	7.9	13.07	26.03	7.0	30.64	15.66
8.7	44.64	41.72	8.8	32.90	43.08	8.9	6.14	42.04	8.9	13.24	25.82	7.9	30.81	15.36
9.7	44.91	41.83	9.8	33.87	43.15	9.9	6.36	41.91	9.9	13.40	25.60	8.9	30.97	15.08
10.7	45.17	41.93	10.8	34.84	43.20	10.9	6.58	41.77	10.9	13.55	25.37	9.9	31.10	14.80
11.7	45.45	42.02	11.8	35.85	43.24	11.9	6.79	41.61	11.9	13.70	25.14	10.9	31.22	14.52
12.7	45.74	42.10	12.8	36.90	43.27	12.9	7.01	41.44	12.9	13.85	24.89	11.9	31.33	14.23
13.7	46.04	42.18	13.8	38.00	43.30	13.9	7.24	41.26	13.9	14.01	24.62	12.9	31.43	13.93
14.7	46.36	42.27	14.7	39.16	43.33	14.9	7.49	41.07	14.9	14.18	24.35	13.9	31.54	13.61
15.7	46.68	42.37	15.7	40.37	43.38	15.9	7.76	40.89	15.9	14.36	24.07	14.9	31.66	13.28
16.7	47.02	42.49	16.7	41.60	43.45	16.9	8.04	40.72	16.9	14.56	23.79	15.9	31.80	12.93
17.7	47.36	42.64	17.7	42.84	43.54	17.9	8.32	40.56	17.9	14.77	23.51	16.9	31.96	12.58
18.7	47.69	42.80	18.7	44.07	43.65	18.8	8.62	40.41	18.9	14.99	23.25	17.9	32.15	12.23
19.7	48.01	42.99	19.7	45.26	43.78	19.8	8.93	40.29	19.9	15.23	23.02	18.9	32.38	11.89
20.7	48.31	43.19	20.7	46.40	43.93	20.8	9.23	40.20	20.9	15.47	22.80	19.9	32.63	11.55
21.7	48.59	43.40	21.7	47.48	44.10	21.8	9.53	40.13	21.9	15.71	22.61	20.9	32.90	11.23
22.7	48.85	43.60	22.7	48.49	44.26	22.8	9.80	40.06	22.9	15.95	22.44	21.9	33.17	10.94
23.7	49.10	43.80	23.7	49.44	44.41	23.8	10.07	40.00	23.9	16.17	22.27	22.9	33.44	10.68
24.7	49.35	43.98	24.7	50.36	44.55	24.8	10.32	39.93	24.9	16.37	22.10	23.9	33.69	10.43
25.7	49.60	44.15	25.7	51.31	44.67	25.8	10.58	39.84	25.9	16.57	21.91	24.9	33.93	10.17
26.7	49.87	44.30	26.7	52.32	44.78	26.8	10.84	39.73	26.9	16.77	21.70	25.9	34.14	9.91
27.7	50.15	44.45	27.7	53.41	44.88	27.8	11.11	39.61	27.9	16.97	21.47	26.9	34.34	9.63
28.7	50.46	44.61	28.7	54.57	44.99	28.8	11.39	39.48	28.9	17.19	21.22	27.9	34.54	9.32
29.7	50.78	44.80	29.7	55.80	45.12	29.8	11.69	39.35	29.9	17.43	20.97	28.9	34.76	8.99
30.7	51.11	45.00	30.7	57.05	45.27	30.8	12.01	39.25	30.9	17.69	20.73	29.9	35.00	8.65
31.7	51.43	45.23	31.7	58.27	45.45	31.8	12.35	39.17	31.9	17.96	20.51	30.9	35.28	8.31
32.7	51.73	45.50	32.7	59.44	45.65	32.8	12.69	39.11	32.9	18.25	20.31	31.9	35.61	7.97
	13.64	+13.60		49.63	+49.62		12.28	+12.24		11.84	+11.80		20.38	+20.35
	$0^h\ 56^m$	$46^s.419$		$1^h\ 28^m$	$47^s.18$		$4^h\ 9^m$	$9^s.789$		$5^h\ 34^m$	$16^s.491$		$7^h\ 0^m$	$36^s.40$
	+85° 47′	47″.03		+88° 50′	47″.93		+85° 19′	42″.36		+85° 9′	23″.64		+87° 11′	10″.74

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	0 56	+85 47	Aug.	1 28	+88 50	Aug.	4 9	+85 19	Aug.	5 34	+85 9	Aug.	7 0	+87 11
	s	″		s	″		s	″		s	″		s	″
1.7	51.73	45.50	1.7	59.44	45.65	1.8	12.69	39.11	1.9	18.25	20.31	1.9	35.96	7.65
2.7	52.01	45.77	2.7	60.54	45.87	2.8	13.02	39.07	2.9	18.54	20.14	2.9	36.32	7.36
3.7	52.27	46.04	3.7	61.56	46.10	3.8	13.34	39.06	3.9	18.82	20.00	3.9	36.69	7.09
4.7	52.51	46.30	4.7	62.51	46.32	4.8	13.64	39.06	4.9	19.09	19.87	4.9	37.04	6.85
5.7	52.73	46.55	5.7	63.40	46.53	5.8	13.92	39.06	5.9	19.34	19.74	5.9	37.38	6.62
6.7	52.95	46.79	6.7	64.27	46.73	6.8	14.19	39.04	6.9	19.58	19.61	6.9	37.69	6.39
7.7	53.17	47.01	7.7	65.17	46.92	7.8	14.46	39.01	7.9	19.81	19.47	7.9	37.98	6.15
8.7	53.41	47.23	8.7	66.11	47.09	8.8	14.73	38.97	8.9	20.04	19.32	8.9	38.27	5.90
9.7	53.66	47.45	9.7	67.08	47.25	9.8	15.01	38.92	9.8	20.28	19.15	9.9	38.55	5.63
10.7	53.91	47.67	10.7	68.10	47.42	10.8	15.31	38.86	10.8	20.53	18.97	10.9	38.84	5.35
11.7	54.18	47.89	11.7	69.17	47.60	11.8	15.61	38.79	11.8	20.78	18.78	11.9	39.15	5.06
12.6	54.47	48.13	12.7	70.27	47.80	12.8	15.93	38.74	12.8	21.05	18.60	12.9	39.48	4.76
13.6	54.76	48.39	13.7	71.38	48.01	13.8	16.25	38.70	13.8	21.34	18.42	13.9	39.83	4.46
14.6	55.03	48.67	14.7	72.47	48.24	14.8	16.59	38.68	14.8	21.63	18.25	14.9	40.21	4.17
15.6	55.29	48.97	15.7	73.53	48.50	15.8	16.93	38.68	15.8	21.94	18.10	15.9	40.62	3.89
16.6	55.54	49.29	16.7	74.55	48.77	16.8	17.28	38.70	16.8	22.25	17.98	16.9	41.05	3.63
17.6	55.77	49.62	17.7	75.50	49.06	17.8	17.62	38.74	17.8	22.56	17.88	17.9	41.49	3.39
18.6	55.98	49.95	18.7	76.37	49.35	18.8	17.94	38.80	18.8	22.87	17.80	18.9	41.92	3.18
19.6	56.17	50.27	19.7	77.17	49.63	19.8	18.24	38.87	19.8	23.16	17.73	19.9	42.34	2.99
20.6	56.35	50.57	20.6	77.93	49.91	20.8	18.53	38.94	20.8	23.44	17.67	20.9	42.75	2.79
21.6	56.53	50.86	21.6	78.70	50.17	21.8	18.81	38.99	21.8	23.71	17.59	21.9	43.14	2.59
22.6	56.72	51.13	22.6	79.51	50.40	22.8	19.09	39.02	22.8	23.97	17.50	22.9	43.50	2.38
23.6	56.93	51.40	23.6	80.37	50.62	23.8	19.38	39.03	23.8	24.23	17.39	23.9	43.85	2.16
24.6	57.15	51.66	24.6	81.30	50.85	24.7	19.68	39.03	24.8	24.50	17.26	24.9	44.22	1.92
25.6	57.40	51.94	25.6	82.30	51.10	25.7	20.01	39.03	25.8	24.79	17.12	25.9	44.61	1.65
26.6	57.66	52.24	26.6	83.33	51.36	26.7	20.36	39.04	26.8	25.10	16.98	26.9	45.03	1.38
27.6	57.91	52.58	27.6	84.35	51.64	27.7	20.72	39.07	27.8	25.43	16.86	27.9	45.48	1.12
28.6	58.14	52.94	28.6	85.33	51.96	28.7	21.08	39.13	28.8	25.76	16.77	28.9	45.97	0.87
29.6	58.35	53.31	29.6	86.24	52.30	29.7	21.43	39.22	29.8	26.10	16.70	29.9	46.48	0.65
30.6	58.54	53.69	30.6	87.05	52.64	30.7	21.77	39.33	30.8	26.43	16.65	30.9	46.98	0.46
31.6	58.70	54.06	31.6	87.79	52.98	31.7	22.09	39.45	31.8	26.76	16.62	31.8	47.47	0.29
32.6	58.84	54.41	32.6	88.47	53.30	32.7	22.39	39.58	32.8	27.07	16.61	32.8	47.94	0.14
	13.64	+13.61		49.69	+49.68		12.28	+12.24		11.84	+11.80		20.36	+20.33
	$0^h\ 56^m$	$46^s.419$		$1^h\ 28^m$	$47^s.18$		$4^h\ 9^m$	$9^s.789$		$5^h\ 34^m$	$16^s.491$		$7^h\ 0^m$	$36^s.40$
	+85° 47′	47″.03		+88° 50′	47″.93		+85° 19′	42″.36		+85° 9′	23″.64		+87° 11′	10″.74

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	0 56	+85 47	Sept.	1 29	+88 50	Sept.	4 9	+85 19	Sept.	5 34	+85 9	Sept.	7 0	+87 10
	s	″		s	″		s	″		s	″		s	″
1.6	58.84	54.41	1.6	28.47	53.30	1.7	22.39	39.58	1.8	27.07	16.61	1.8	47.94	60.14
2.6	58.98	54.75	2.6	29.10	53.61	2.7	22.68	39.70	2.8	27.36	16.60	2.8	48.40	59.99
3.6	59.11	55.07	3.6	29.74	53.91	3.7	22.96	39.81	3.8	27.64	16.58	3.8	48.83	59.84
4.6	59.25	55.38	4.6	30.41	54.19	4.7	23.24	39.90	4.8	27.92	16.54	4.8	49.25	59.69
5.6	59.42	55.68	5.6	31.10	54.47	5.7	23.52	39.98	5.8	28.20	16.49	5.8	49.66	59.52
6.6	59.59	55.99	6.6	31.83	54.74	6.7	23.81	40.04	6.8	28.48	16.44	6.8	50.08	59.33
7.6	59.77	56.30	7.6	32.61	55.02	7.7	24.11	40.10	7.8	28.76	16.38	7.8	50.50	59.14
8.6	59.95	56.62	8.6	33.43	55.32	8.7	24.42	40.17	8.8	29.06	16.31	8.8	50.94	58.94
9.6	60.14	56.96	9.6	34.26	55.63	9.7	24.74	40.25	9.8	29.38	16.25	9.8	51.41	58.73
10.6	60.33	57.32	10.6	35.08	55.95	10.7	25.08	40.35	10.8	29.70	16.21	10.8	51.91	58.53
11.6	60.51	57.70	11.6	35.86	56.30	11.7	25.41	40.48	11.8	30.04	16.18	11.8	52.43	58.34
12.6	60.67	58.08	12.6	36.59	56.66	12.7	25.75	40.62	12.8	30.38	16.17	12.8	52.96	58.17
13.6	60.81	58.48	13.6	37.26	57.03	13.7	26.08	40.78	13.8	30.72	16.17	13.8	53.50	58.03
14.6	60.93	58.88	14.6	37.86	57.41	14.7	26.39	40.97	14.8	31.05	16.19	14.8	54.05	57.91
15.6	61.03	59.28	15.6	38.39	57.79	15.7	26.69	41.16	15.7	31.38	16.24	15.8	54.59	57.81
16.6	61.12	59.67	16.6	38.86	58.16	16.7	26.98	41.35	16.7	31.69	16.29	16.8	55.11	57.72
17.5	61.20	60.04	17.6	39.30	58.51	17.7	27.25	41.53	17.7	31.99	16.34	17.8	55.61	57.63
18.5	61.29	60.39	18.6	39.76	58.84	18.7	27.51	41.69	18.7	32.28	16.38	18.8	56.08	57.53
19.5	61.39	60.72	19.6	40.26	59.16	19.7	27.78	41.84	19.7	32.57	16.40	19.8	56.53	57.42
20.5	61.51	61.05	20.6	40.83	59.47	20.7	28.06	41.97	20.7	32.86	16.40	20.8	56.99	57.29
21.5	61.64	61.39	21.6	41.47	59.79	21.7	28.37	42.09	21.7	33.16	16.38	21.8	57.46	57.14
22.5	61.79	61.75	22.6	42.16	60.12	22.7	28.68	42.22	22.7	33.48	16.37	22.8	57.96	56.98
23.5	61.94	62.13	23.6	42.86	60.48	23.7	29.00	42.37	23.7	33.82	16.36	23.8	58.50	56.82
24.5	62.08	62.54	24.6	43.52	60.86	24.7	29.34	42.53	24.7	34.17	16.38	24.8	59.07	56.68
25.5	62.19	62.97	25.6	44.12	61.27	25.7	29.67	42.73	25.7	34.52	16.42	25.8	59.65	56.56
26.5	62.28	63.39	26.5	44.63	61.69	26.7	29.99	42.96	26.7	34.87	16.49	26.8	60.23	56.47
27.5	62.34	63.82	27.5	45.04	62.11	27.7	30.27	43.19	27.7	35.21	16.59	27.8	60.80	56.40
28.5	62.38	64.23	28.5	45.37	62.51	28.7	30.54	43.44	28.7	35.53	16.70	28.8	61.36	56.36
29.5	62.41	64.61	29.5	45.64	62.89	29.7	30.81	43.68	29.7	35.83	16.81	29.8	61.89	56.33
30.5	62.44	64.99	30.5	45.89	63.26	30.6	31.05	43.91	30.7	36.12	16.91	30.8	62.41	56.30
31.5	62.48	65.35	31.5	46.16	63.61	31.6	31.30	44.12	31.7	36.40	17.00	31.8	62.89	56.26
	13.65	+13.62		49.80	+49.79		12.28	+12.24		11.84	+11.80		20.35	+20.32
	$0^h\ 56^m$	$46^s.419$		$1^h\ 28^m$	$47^s.18$		$4^h\ 9^m$	$9^s.789$		$5^h\ 34^m$	$16^s.491$		$7^h\ 0^m$	$36^s.40$
	+85° 47′	47″.03		+88° 50′	47″.93		+85° 19′	42″.36		+85° 9′	23″.64		+87° 11′	10″.74

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	De na N
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	
Oct.	0 57	+85 48	Oct.	1 29	+88 51	Oct.	4 9	+85 19	Oct.	5 34	+85 9	Oct.	7 1	+87
	s	″		s	″		s	″		s	″		s	
1.5	2.48	5.35	1.5	46.16	3.61	1.6	31.30	44.12	1.7	36.40	17.00	1.8	2.89	56
2.5	2.52	5.69	2.5	46.45	3.95	2.6	31.53	44.32	2.7	36.67	17.08	2.8	3.36	56
3.5	2.57	6.03	3.5	46.78	4.28	3.6	31.77	44.51	3.7	36.95	17.15	3.8	3.84	56
4.5	2.64	6.38	4.5	47.17	4.62	4.6	32.03	44.69	4.7	37.23	17.21	4.8	4.32	56
5.5	2.72	6.74	5.5	47.59	4.96	5.6	32.30	44.87	5.7	37.52	17.27	5.8	4.82	56
6.5	2.79	7.11	6.5	48.04	5.31	6.6	32.58	45.06	6.7	37.82	17.33	6.8	5.33	55
7.5	2.86	7.49	7.5	48.48	5.68	7.6	32.86	45.26	7.7	38.14	17.40	7.7	5.86	55
8.5	2.92	7.88	8.5	48.88	6.07	8.6	33.15	45.48	8.7	38.46	17.48	8.7	6.41	55
9.5	2.97	8.29	9.5	49.24	6.47	9.6	33.44	45.73	9.7	38.78	17.58	9.7	6.98	55
10.5	3.00	8.72	10.5	49.53	6.89	10.6	33.72	45.99	10.7	39.11	17.71	10.7	7.57	55
11.5	3.01	9.15	11.5	49.74	7.32	11.6	33.99	46.27	11.7	39.43	17.86	11.7	8.16	55
12.5	3.00	9.58	12.5	49.87	7.74	12.6	34.24	46.57	12.7	39.75	18.03	12.7	8.75	55
13.5	2.97	9.99	13.5	49.94	8.14	13.6	34.47	46.87	13.7	40.05	18.21	13.7	9.31	55
14.5	2.94	10.38	14.5	49.97	8.53	14.6	34.69	47.16	14.7	40.33	18.39	14.7	9.84	55
15.5	2.90	10.74	15.5	50.00	8.91	15.6	34.89	47.44	15.7	40.59	18.56	15.7	10.35	55
16.5	2.87	11.09	16.5	50.06	9.28	16.6	35.10	47.70	16.7	40.85	18.71	16.7	10.84	55
17.5	2.85	11.44	17.5	50.18	9.62	17.6	35.31	47.94	17.7	41.12	18.84	17.7	11.32	5
18.5	2.86	11.79	18.5	50.37	9.95	18.6	35.54	48.16	18.7	41.39	18.95	18.7	11.81	5
19.5	2.89	12.15	19.5	50.61	10.31	19.6	35.79	48.38	19.7	41.67	19.06	19.7	12.32	5
20.5	2.92	12.52	20.5	50.88	10.70	20.6	36.05	48.62	20.7	41.97	19.17	20.7	12.86	5
21.5	2.95	12.92	21.5	51.13	11.10	21.6	36.31	48.87	21.6	42.29	19.29	21.7	13.42	5
22.5	2.95	13.35	22.5	51.32	11.52	22.6	36.57	49.16	22.6	42.61	19.44	22.7	14.00	5
23.5	2.92	13.78	23.5	51.42	11.96	23.6	36.82	49.48	23.6	42.92	19.62	23.7	14.60	5
24.4	2.87	14.20	24.5	51.43	12.40	24.6	37.05	49.81	24.6	43.22	19.83	24.7	15.19	5
25.4	2.80	14.61	25.5	51.34	12.82	25.6	37.26	50.15	25.6	43.51	20.06	25.7	15.76	5
26.4	2.71	15.00	26.5	51.18	13.23	26.6	37.45	50.48	26.6	43.78	20.29	26.7	16.30	5
27.4	2.61	15.37	27.5	50.98	13.62	27.6	37.62	50.80	27.6	44.04	20.52	27.7	16.81	56
28.4	2.52	15.72	28.5	50.79	13.98	28.6	37.78	51.11	28.6	44.27	20.74	28.7	17.30	56
29.4	2.44	16.05	29.5	50.62	14.33	29.6	37.94	51.40	29.6	44.50	20.95	29.7	17.77	56.2
30.4	2.37	16.37	30.5	50.49	14.67	30.6	38.10	51.68	30.6	44.73	21.14	30.7	18.23	56.3
31.4	2.30	16.69	31.5	50.41	15.01	31.6	38.27	51.95	31.6	44.96	21.32	31.7	18.69	56.4
32.4	2.25	17.01	32.4	50.36	15.35	32.6	38.44	52.22	32.6	45.20	21.49	32.7	19.16	56.4
	13.66	+13.63		49.93	+49.92		12.28	+12.24		11.84	+11.80		20.34	+20.3
	0h 56m	46s.419		1h 28m	47s.18		4h 9m	9s.789		5h 34m	16s.491		7h 0m	36s.40
	+85° 47′	47″.03		+88° 50′	47″.93		+85° 19′	42″.36		+85° 9′	23″.64		+87° 11′	10″.

[Eph 14]

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	0 56	+85 48	Nov.	1 29	+88 51	Nov.	4 9	+85 19	Nov.	5 34	+85 9	Nov.	7 1	+87 10
	s	″		s	″		s	″		s	″		s	″
1.4	62.25	17.01	1.4	50.36	15.35	1.6	38.44	52.22	1.6	45.20	21.49	1.7	19.16	56.48
2.4	62.20	17.35	2.4	50.33	15.70	2.6	38.63	52.49	2.6	45.44	21.66	2.7	19.64	56.53
3.4	62.15	17.70	3.4	50.31	16.05	3.6	38.82	52.77	3.6	45.70	21.84	3.7	20.14	56.58
4.4	62.10	18.05	4.4	50.26	16.42	4.6	39.02	53.07	4.6	45.96	22.03	4.7	20.65	56.64
5.4	62.04	18.43	5.4	50.17	16.80	5.5	39.21	53.38	5.6	46.23	22.24	5.7	21.18	56.72
6.4	61.95	18.81	6.4	50.01	17.20	6.5	39.40	53.71	6.6	46.49	22.47	6.7	21.72	56.82
7.4	61.84	19.19	7.4	49.78	17.61	7.5	39.58	54.07	7.6	46.76	22.71	7.7	22.26	56.94
8.4	61.71	19.58	8.4	49.48	18.01	8.5	39.74	54.43	8.6	47.02	22.98	8.7	22.80	57.08
9.4	61.56	19.95	9.4	49.11	18.40	9.5	39.88	54.79	9.6	47.26	23.27	9.7	23.32	57.25
10.4	61.41	20.30	10.4	48.68	18.78	10.5	40.01	55.16	10.6	47.48	23.56	10.7	23.81	57.42
11.4	61.24	20.63	11.4	48.23	19.14	11.5	40.12	55.51	11.6	47.68	23.84	11.7	24.27	57.59
12.4	61.09	20.93	12.4	47.81	19.48	12.5	40.23	55.84	12.6	47.87	24.11	12.6	24.70	57.75
13.4	60.96	21.22	13.4	47.42	19.80	13.5	40.33	56.14	13.6	48.06	24.35	13.6	25.12	57.90
14.4	60.84	21.50	14.4	47.10	20.11	14.5	40.44	56.43	14.6	48.25	24.57	14.6	25.54	58.03
15.4	60.73	21.80	15.4	46.84	20.42	15.5	40.57	56.71	15.6	48.45	24.78	15.6	25.98	58.14
16.4	60.63	22.12	16.4	46.61	20.75	16.5	40.72	57.00	16.6	48.66	24.99	16.6	26.43	58.24
17.4	60.53	22.45	17.4	46.39	21.10	17.5	40.88	57.31	17.6	48.89	25.22	17.6	26.91	58.35
18.4	60.43	22.79	18.4	46.13	21.47	18.5	41.03	57.64	18.6	49.13	25.46	18.6	27.41	58.48
19.4	60.30	23.15	19.4	45.80	21.86	19.5	41.18	58.00	19.6	49.37	25.73	19.6	27.93	58.63
20.4	60.14	23.51	20.4	45.37	22.25	20.5	41.31	58.38	20.6	49.60	26.03	20.6	28.44	58.80
21.4	59.96	23.86	21.4	44.85	22.63	21.5	41.42	58.77	21.6	49.82	26.35	21.6	28.93	59.00
22.4	59.75	24.19	22.4	44.25	22.99	22.5	41.51	59.15	22.6	50.01	26.68	22.6	29.39	59.23
23.4	59.53	24.49	23.4	43.59	23.33	23.5	41.57	59.53	23.6	50.18	27.00	23.6	29.82	59.47
24.4	59.32	24.76	24.4	42.92	23.65	24.5	41.62	59.89	24.6	50.34	27.31	24.6	30.23	59.70
25.4	59.12	25.02	25.4	42.28	23.95	25.5	41.67	60.22	25.6	50.48	27.61	25.6	30.6	59.92
26.4	58.93	25.26	26.4	41.68	24.23	26.5	41.72	60.55	26.6	50.61	27.89	26.6	30.95	60.13
27.4	58.75	25.50	27.4	41.11	24.49	27.5	41.76	60.86	27.5	50.74	28.16	27.6	31.31	60.32
28.4	58.58	25.73	28.4	40.58	24.76	28.5	41.81	61.16	28.5	50.87	28.42	28.6	31.67	60.51
29.4	58.42	25.97	29.4	40.08	25.03	29.5	41.87	61.46	29.5	51.02	28.67	29.6	32.03	60.69
30.3	58.26	26.22	30.4	39.59	25.31	30.5	41.93	61.76	30.5	51.17	28.93	30.6	32.40	60.87
31.3	58.09	26.48	31.4	39.09	25.61	31.5	42.00	62.07	31.5	51.33	29.20	31.6	32.78	61.05
13.67		+13.64	50.07		+50.06	12.29		+12.25	11.84		+11.80	20.35		+20.32
$0^h\ 56^m$		$46^s.419$	$1^h\ 28^m$		$47^s.18$	$4^h\ 9^m$		$9^s.789$	$5^h\ 34^m$		$16^s.491$	$7^h\ 0^m$		$36^s.40$
+85° 47′		47″.03	+88° 50′		47″.93	+85° 19′		42″.36	+85° 9′		23″.64	+87° 11′		10″.74

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	0 56	+85 48	Dec.	1 29	+88 51	Dec.	4 9	+85 20	Dec.	5 34	+85 9	Dec.	7 1	+87 11
	s	″		s	″		s	″		s	″		s	″
1.3	58.09	26.48	1.4	39.09	25.61	1.5	42.00	2.07	1.5	51.33	29.20	1.6	32.78	1.05
2.3	57.92	26.75	2.4	38.57	25.92	2.5	42.07	2.40	2.5	51.49	29.47	2.6	33.18	1.24
3.3	57.73	27.03	3.4	37.99	26.24	3.5	42.14	2.74	3.5	51.66	29.77	3.6	33.59	1.45
4.3	57.52	27.32	4.4	37.34	26.56	4.5	42.20	3.11	4.5	51.82	30.09	4.6	34.00	1.68
5.3	57.29	27.59	5.4	36.62	26.88	5.5	42.24	3.49	5.5	51.97	30.43	5.6	34.41	1.93
6.3	57.04	27.86	6.4	35.82	27.19	6.5	42.26	3.88	6.5	52.10	30.78	6.6	34.80	2.21
7.3	56.78	28.11	7.4	34.96	27.48	7.5	42.26	4.26	7.5	52.21	31.14	7.6	35.16	2.50
8.3	56.51	28.33	8.3	34.07	27.76	8.5	42.25	4.63	8.5	52.31	31.49	8.6	35.49	2.79
9.3	56.25	28.53	9.3	33.19	28.00	9.5	42.23	4.98	9.5	52.40	31.83	9.6	35.78	3.08
10.3	56.00	28.71	10.3	32.35	28.22	10.5	42.21	5.30	10.5	52.48	32.14	10.6	36.05	3.35
11.3	55.77	28.88	11.3	31.57	28.43	11.5	42.19	5.60	11.5	52.55	32.43	11.6	36.31	3.60
12.3	55.56	29.04	12.3	30.86	28.63	12.4	42.18	5.88	12.5	52.62	32.71	12.6	36.58	3.83
13.3	55.36	29.22	13.3	30.21	28.84	13.4	42.18	6.17	13.5	52.71	32.98	13.6	36.85	4.04
14.3	55.17	29.42	14.3	29.58	29.07	14.4	42.19	6.46	14.5	52.81	33.25	14.6	37.15	4.25
15.3	54.98	29.64	15.3	28.93	29.33	15.4	42.22	6.77	15.5	52.93	33.54	15.6	37.49	4.48
16.3	54.76	29.87	16.3	28.22	29.61	16.4	42.23	7.11	16.5	53.04	33.85	16.6	37.84	4.73
17.3	54.51	30.10	17.3	27.42	29.89	17.4	42.23	7.47	17.5	53.15	34.18	17.6	38.18	5.00
18.3	54.25	30.32	18.3	26.53	30.16	18.4	42.21	7.84	18.5	53.25	34.54	18.6	38.50	5.29
19.3	53.97	30.51	19.3	25.56	30.41	19.4	42.17	8.21	19.5	53.32	34.91	19.5	38.80	5.61
20.3	53.68	30.68	20.3	24.54	30.63	20.4	42.11	8.57	20.5	53.37	35.27	20.5	39.07	5.94
21.3	53.38	30.83	21.3	23.49	30.83	21.4	42.03	8.92	21.5	53.41	35.63	21.5	39.30	6.27
22.3	53.08	30.96	22.3	22.46	31.01	22.4	41.95	9.24	22.5	53.43	35.97	22.5	39.49	6.59
23.3	52.80	31.06	23.3	21.47	31.17	23.4	41.86	9.55	23.5	53.44	36.29	23.5	39.66	6.90
24.3	52.54	31.15	24.3	20.52	31.31	24.4	41.76	9.82	24.5	53.44	36.60	24.5	39.82	7.20
25.3	52.28	31.24	25.3	19.61	31.45	25.4	41.67	10.09	25.5	53.44	36.90	25.5	39.98	7.48
26.3	52.04	31.32	26.3	18.75	31.58	26.4	41.59	10.35	26.5	53.44	37.18	26.5	40.14	7.75
27.3	51.81	31.42	27.3	17.92	31.72	27.4	41.52	10.61	27.5	53.46	37.46	27.5	40.30	8.01
28.3	51.58	31.53	28.3	17.08	31.88	28.4	41.46	10.88	28.5	53.49	37.74	28.5	40.47	8.28
29.3	51.34	31.64	29.3	16.22	32.04	29.4	41.40	11.16	29.5	53.52	38.04	29.5	40.66	8.55
30.3	51.09	31.76	30.3	15.33	32.21	30.4	41.33	11.46	30.5	53.55	38.35	30.5	40.87	8.82
31.3	50.82	31.88	31.3	14.39	32.38	31.4	41.25	11.77	31.5	53.58	38.68	31.5	41.08	9.11
32.3	50.53	32.01	32.3	13.39	32.55	32.4	41.17	12.10	32.5	53.60	39.02	32.5	41.28	9.43
13.68		+13.64	50.18		+50.17	12.30		+12.26	11.85		+11.81	20.36		+20.33
$0^h\ 56^m$		$46^s.419$	$1^h\ 28^m$		$47^s.18$	$4^h\ 9^m$		$9^s.789$	$5^h\ 34^m$		$16^s.491$	$7^h\ 0^m$		$36^s.40$
+85° 47′		47″.03	+88° 50′		47″.93	+85° 19′		42″.36	+85° 9′		23″.64	+87° 11′		10″.74

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	8 14	+88 53	Jan.	9 25	+81 42	Jan.	10 20	+82 59	Jan.	12 14	+88 10	Jan.	15 4	+87 33
	s	″		s	″		s	″		s	″		s	″
0.6	12.43	31.32	0.6	6.07	18.84	0.7	53.12	33.79	0.7	49.31	13.45	0.8	28.19	28.51
1.6	13.05	31.64	1.6	6.21	19.06	1.7	53.31	33.95	1.7	50.06	13.44	1.8	28.61	28.27
2.6	13.60	31.94	2.6	6.33	19.28	2.6	53.49	34.11	2.7	50.79	13.44	2.8	29.03	28.04
3.6	14.09	32.22	3.6	6.44	19.49	3.6	53.65	34.26	3.7	51.48	13.45	3.8	29.44	27.84
4.6	14.56	32.48	4.6	6.54	19.69	4.6	53.80	34.41	4.7	52.13	13.47	4.8	29.83	27.65
5.6	15.03	32.74	5.6	6.65	19.88	5.6	53.94	34.55	5.7	52.76	13.48	5.8	30.21	27.45
6.5	15.48	33.00	6.6	6.75	20.06	6.6	54.09	34.68	6.7	53.37	13.49	6.8	30.56	27.25
7.5	15.98	33.25	7.6	6.86	20.22	7.6	54.24	34.79	7.7	53.98	13.48	7.8	30.89	27.05
8.5	16.54	33.50	8.6	6.98	20.39	8.6	54.40	34.90	8.7	54.61	13.47	8.8	31.23	26.83
9.5	17.15	33.75	9.6	7.11	20.56	9.6	54.56	35.01	9.7	55.27	13.45	9.8	31.59	26.60
10.5	17.78	34.02	10.6	7.24	20.75	10.6	54.74	35.13	10.7	55.97	13.42	10.8	31.97	26.36
11.5	18.42	34.32	11.6	7.37	20.96	11.6	54.92	35.27	11.7	56.71	13.41	11.8	32.38	26.11
12.5	19.03	34.64	12.6	7.50	21.19	12.6	55.10	35.44	12.7	57.49	13.42	12.8	32.83	25.87
13.5	19.58	34.97	13.6	7.63	21.45	13.6	55.28	35.63	13.7	58.29	13.46	13.8	33.32	25.65
14.5	20.04	35.32	14.6	7.75	21.72	14.6	55.45	35.85	14.7	59.07	13.52	14.8	33.82	25.45
15.5	20.39	35.67	15.6	7.86	22.00	15.6	55.61	36.08	15.7	59.81	13.61	15.8	34.34	25.27
16.5	20.65	36.01	16.6	7.95	22.28	16.6	55.75	36.31	16.7	60.49	13.71	16.8	34.85	25.13
17.5	20.84	36.33	17.6	8.03	22.55	17.6	55.87	36.53	17.7	61.12	13.82	17.8	35.32	25.01
18.5	21.00	36.62	18.6	8.09	22.79	18.6	55.99	36.73	18.7	61.71	13.92	18.8	35.75	24.90
19.5	21.18	36.89	19.6	8.16	23.01	19.6	56.10	36.92	19.7	62.26	14.01	19.8	36.15	24.78
20.5	21.40	37.15	20.6	8.24	23.22	20.6	56.22	37.10	20.7	62.81	14.08	20.8	36.54	24.66
21.5	21.68	37.41	21.6	8.33	23.43	21.6	56.34	37.27	21.7	63.38	14.14	21.8	36.93	24.52
22.5	22.00	37.68	22.6	8.42	23.65	22.6	56.47	37.45	22.7	64.00	14.20	22.8	37.34	24.36
23.5	22.35	37.97	23.6	8.51	23.88	23.6	56.61	37.63	23.7	64.66	14.26	23.8	37.78	24.18
24.5	22.68	38.30	24.5	8.61	24.14	24.6	56.76	37.84	24.7	65.35	14.34	24.8	38.26	24.02
25.5	22.97	38.64	25.5	8.70	24.42	25.6	56.91	38.08	25.7	66.06	14.44	25.8	38.77	23.88
26.5	23.19	38.98	26.5	8.78	24.72	26.6	57.05	38.34	26.7	66.78	14.56	26.8	39.31	23.74
27.5	23.33	39.33	27.5	8.86	25.03	27.6	57.18	38.61	27.7	67.49	14.71	27.8	39.87	23.62
28.5	23.39	39.70	28.5	8.92	25.36	28.6	57.29	38.89	28.7	68.16	14.87	28.8	40.43	23.52
29.5	23.38	40.06	29.5	8.98	25.68	29.6	57.40	39.18	29.7	68.80	15.05	29.8	40.98	23.45
30.5	23.30	40.40	30.5	9.03	25.99	30.6	57.50	39.47	30.7	69.39	15.24	30.8	41.50	23.42
31.5	23.18	40.72	31.5	9.07	26.28	31.6	57.58	39.75	31.6	69.94	15.43	31.8	42.01	23.39
32.5	23.04	41.03	32.5	9.10	26.57	32.6	57.66	40.02	32.6	70.46	15.62	32.8	42.50	23.36
	51.77	+51.76		6.93	+6.86		8.20	+8.14		31.32	+31.30		23.46	+23.44
	$8^{h}\ 12^{m}$	$47^{s}.195$		$9^{h}\ 24^{m}$	$55^{s}.328$		$10^{h}\ 20^{m}$	$42^{s}.090$		$12^{h}\ 14^{m}$	$27^{s}.330$		$15^{h}\ 4^{m}$	$39^{s}.67$
	+88° 53′	33″.49		+81° 42′	28″.51		+82° 59′	48″.65		+88° 10′	35″.93		+87° 33′	52″.17

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
Mean Solar Date.	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	8 14	+88 53	Feb.	9 25	+81 42	Feb.	10 20	+82 59	Feb.	12 15	+88 10	Feb.	15 4	+87 33
	s	″		s	″		s	″		s	″		s	″
1.5	23.04	41.03	1.5	9.10	26.57	1.6	57.66	40.02	1.6	10.46	15.62	1.8	42.50	23.36
2.5	22.89	41.33	2.5	9.13	26.85	2.6	57.73	40.27	2.6	10.95	15.79	2.8	42.96	23.33
3.5	22.77	41.60	3.5	9.16	27.11	3.6	57.80	40.51	3.6	11.43	15.96	3.8	43.41	23.30
4.5	22.68	41.86	4.5	9.20	27.36	4.6	57.88	40.75	4.6	11.91	16.12	4.8	43.85	23.26
5.5	22.64	42.14	5.5	9.24	27.61	5.6	57.97	40.98	5.6	12.41	16.27	5.8	44.29	23.21
6.5	22.64	42.43	6.5	9.29	27.87	6.6	58.06	41.21	6.6	12.95	16.42	6.7	44.74	23.14
7.5	22.66	42.73	7.5	9.34	28.14	7.5	58.16	41.46	7.6	13.52	16.56	7.7	45.22	23.06
8.5	22.67	43.05	8.5	9.39	28.43	8.5	58.26	41.72	8.6	14.12	16.72	8.7	45.74	22.99
9.5	22.63	43.39	9.5	9.44	28.75	9.5	58.36	42.01	9.6	14.74	16.90	9.7	46.30	22.93
10.5	22.52	43.74	10.5	9.48	29.09	10.5	58.45	42.32	10.6	15.36	17.11	10.7	46.87	22.89
11.5	22.30	44.10	11.5	9.51	29.43	11.5	58.53	42.65	11.6	15.94	17.35	11.7	47.44	22.88
12.4	21.97	44.45	12.5	9.52	29.77	12.5	58.59	42.98	12.6	16.46	17.61	12.7	48.00	22.91
13.4	21.56	44.77	13.5	9.52	30.10	13.5	58.64	43.30	13.6	16.92	17.87	13.7	48.53	22.96
14.4	21.11	45.07	14.5	9.51	30.40	14.5	58.67	43.61	14.6	17.31	18.13	14.7	49.02	23.01
15.4	20.67	45.34	15.5	9.50	30.68	15.5	58.69	43.89	15.6	17.66	18.37	15.7	49.48	23.07
16.4	20.26	45.59	16.5	9.49	30.94	16.5	58.71	44.15	16.6	17.99	18.60	16.7	49.91	23.13
17.4	19.89	45.83	17.5	9.49	31.19	17.5	58.74	44.40	17.6	18.34	18.81	17.7	50.33	23.18
18.4	19.57	46.08	18.5	9.50	31.44	18.5	58.78	44.66	18.6	18.71	19.01	18.7	50.75	23.21
19.4	19.29	46.34	19.5	9.51	31.71	19.5	58.83	44.92	19.6	19.12	19.20	19.7	51.19	23.23
20.4	19.03	46.62	20.5	9.52	31.99	20.5	58.88	45.19	20.6	19.57	19.41	20.7	51.67	23.23
21.4	18.73	46.92	21.5	9.53	32.30	21.5	58.93	45.48	21.6	20.04	19.64	21.7	52.18	23.25
22.4	18.38	47.23	22.5	9.54	32.62	22.5	58.98	45.80	22.6	20.52	19.89	22.7	52.72	23.29
23.4	17.95	47.55	23.5	9.53	32.96	23.5	59.02	46.13	23.6	20.98	20.16	23.7	53.27	23.35
24.4	17.44	47.87	24.5	9.51	33.30	24.5	59.05	46.48	24.6	21.41	20.45	24.7	53.82	23.43
25.4	16.87	48.18	25.5	9.49	33.64	25.5	59.06	46.82	25.6	21.80	20.76	25.7	54.36	23.53
26.4	16.22	48.49	26.5	9.46	33.97	26.5	59.06	47.16	26.6	22.15	21.07	26.7	54.88	23.65
27.4	15.51	48.77	27.5	9.41	34.28	27.5	59.06	47.49	27.6	22.45	21.38	27.7	55.37	23.79
28.4	14.78	49.03	28.5	9.36	34.58	28.5	59.04	47.82	28.6	22.70	21.69	28.7	55.84	23.95
29.4	14.05	49.27	29.5	9.31	34.86	29.5	59.02	48.13	29.6	22.92	21.99	29.7	56.29	24.10
30.4	13.34	49.50	30.4	9.26	35.12	30.5	59.00	48.43	30.6	23.12	22.27	30.7	56.71	24.24
	51.90	+51.89		6.93	+6.86		8.20	+8.14		31.35	+31.33		23.45	+23.43
	$8^h\ 12^m$	$47^s.195$		$9^h\ 24^m$	$55^s.328$		$10^h\ 20^m$	$42^s.090$		$12^h\ 14^m$	$27^s.330$		$15^h\ 4^m$	$39^s.67$
	+88° 53′	33″.49		+81° 42′	28″.51		+82° 59′	48″.65		+88° 10′	35″.93		+87° 33′	52″.17

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119.			**1 H. Draconis.**			**30 H. Camelop.**			**Bradley 1672.**			**Groombridge 2283.**		
Mag. 7.0			Mag. 4.6			Mag. 5.3			Mag. 6.3			Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	8 13	+88 53	Mar.	9 25	+81 42	Mar.	10 20	+82 59	Mar.	12 15	+88 10	Mar.	15 4	+87 33
	s	″		s	″		s	″		s	″		s	″
1.4	74.05	49.27	1.5	9.31	34.86	1.5	59.02	48.13	1.6	22.92	21.99	1.7	56.29	24.10
2.4	73.34	49.50	2.4	9.26	35.12	2.5	59.00	48.43	2.6	23.12	22.27	2.7	56.71	24.24
3.4	72.67	49.71	3.4	9.21	35.38	3.5	58.97	48.71	3.6	23.31	22.54	3.7	57.10	24.38
4.4	72.03	49.92	4.4	9.16	35.63	4.5	58.95	48.97	4.6	23.51	22.81	4.7	57.49	24.51
5.4	71.45	50.12	5.4	9.13	35.87	5.5	58.94	49.23	5.6	23.73	23.06	5.7	57.88	24.62
6.4	70.91	50.35	6.4	9.10	36.13	6.5	58.94	49.50	6.6	23.99	23.30	6.7	58.29	24.72
7.4	70.39	50.60	7.4	9.07	36.40	7.5	58.95	49.78	7.6	24.29	23.55	7.7	58.72	24.82
8.4	69.84	50.85	8.4	9.04	36.69	8.5	58.96	50.08	8.5	24.60	23.83	8.7	59.18	24.93
9.4	69.22	51.12	9.4	9.00	37.00	9.5	58.95	50.40	9.5	24.90	24.13	9.7	59.66	25.06
10.4	68.50	51.38	10.4	8.96	37.32	10.5	58.93	50.74	10.5	25.17	24.45	10.7	60.15	25.20
11.4	67.69	51.64	11.4	8.90	37.63	11.5	58.90	51.08	11.5	25.40	24.78	11.7	60.63	25.37
12.4	66.80	51.88	12.4	8.83	37.93	12.5	58.85	51.41	12.5	25.56	25.12	12.7	61.08	25.58
13.4	65.86	52.09	13.4	8.74	38.20	13.5	58.79	51.72	13.5	25.66	25.45	13.7	61.49	25.81
14.4	64.91	52.27	14.4	8.65	38.45	14.5	58.73	52.01	14.5	25.70	25.78	14.7	61.86	26.03
15.4	63.98	52.43	15.4	8.56	38.67	15.5	58.65	52.28	15.5	25.71	26.09	15.6	62.19	26.25
16.4	63.11	52.58	16.4	8.48	38.88	16.4	58.58	52.53	16.5	25.71	26.38	16.6	62.50	26.46
17.4	62.32	52.72	17.4	8.40	39.08	17.4	58.52	52.77	17.5	25.74	26.65	17.6	62.80	26.66
18.4	61.58	52.87	18.4	8.33	39.28	18.4	58.47	53.01	18.5	25.80	26.91	18.6	63.11	26.84
19.4	60.86	53.03	19.4	8.27	39.50	19.4	58.43	53.26	19.5	25.89	27.18	19.6	63.45	27.00
20.3	60.12	53.21	20.4	8.21	39.73	20.4	58.39	53.52	20.5	26.00	27.46	20.6	63.82	27.17
21.3	59.34	53.40	21.4	8.14	39.99	21.4	58.34	53.81	21.5	26.13	27.75	21.6	64.22	27.35
22.3	58.50	53.61	22.4	8.07	40.26	22.4	58.30	54.12	22.5	26.26	28.07	22.6	64.63	27.55
23.3	57.59	53.81	23.4	7.99	40.53	23.4	58.24	54.43	23.5	26.36	28.40	23.6	65.04	27.77
24.3	56.61	54.00	24.4	7.90	40.80	24.4	58.17	54.74	24.5	26.41	28.75	24.6	65.44	28.01
25.3	55.57	54.19	25.4	7.80	41.06	25.4	58.09	55.05	25.5	26.42	29.10	25.6	65.81	28.27
26.3	54.48	54.35	26.4	7.68	41.31	26.4	57.99	55.35	26.5	26.39	29.45	26.6	66.15	28.55
27.3	53.38	54.49	27.4	7.56	41.53	27.4	57.88	55.63	27.5	26.31	29.80	27.6	66.46	28.84
28.3	52.28	54.61	28.4	7.44	41.74	28.4	57.77	55.90	28.5	26.19	30.13	28.6	66.74	29.13
29.3	51.19	54.71	29.4	7.32	41.92	29.4	57.66	56.14	29.5	26.04	30.45	29.6	67.00	29.41
30.3	50.13	54.79	30.4	7.21	42.09	30.4	57.55	56.36	30.5	25.88	30.76	30.6	67.24	29.68
31.3	49.12	54.86	31.4	7.10	42.25	31.4	57.45	56.57	31.5	25.72	31.04	31.6	67.46	29.95
32.3	48.19	54.93	32.4	7.00	42.40	32.4	57.35	56.78	32.5	25.58	31.32	32.6	67.67	30.20
	51.99	+51.98		6.94	+6.86		8.20	+8.14		31.38	+31.37		23.46	+23.44
	$8^{h}\ 12^{m}$	$47^{s}.195$		$9^{h}\ 24^{m}$	$55^{s}.328$		$10^{h}\ 20^{m}$	$42^{s}.090$		$12^{h}\ 14^{m}$	$27^{s}.330$		$15^{h}\ 4^{m}$	$39^{s}.67$
	$+88^{\circ}\ 53'$	$33''.49$		$+81^{\circ}\ 42'$	$28''.51$		$+82^{\circ}\ 59'$	$48''.65$		$+88^{\circ}\ 10'$	$35''.93$		$+87^{\circ}\ 33'$	$52''.17$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 22** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascen. sion.	Dec nati *Nor*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Apr.	8 13	+88 53	Apr.	9 25	+81 42	Apr.	10 20	+82 59	Apr.	12 15	+88 10	Apr.	15 5	+87
	s	″		s	″		s	″		s	″		s	
1.3	48.19	54.93	1.4	7.00	42.40	1.4	57.35	56.78	1.5	25.58	31.32	1.6	7.67	30.
2.3	47.31	55.01	2.4	6.90	42.56	2.4	57.26	56.99	2.5	25.47	31.59	2.6	7.89	30.
3.3	46.46	55.10	3.4	6.81	42.73	3.4	57.18	57.20	3.5	25.39	31.85	3.6	8.13	30.
4.3	45.60	55.21	4.4	6.72	42.92	4.4	57.10	57.43	4.5	25.34	32.12	4.6	8.39	30.
5.3	44.70	55.33	5.4	6.64	43.12	5.4	57.02	57.67	5.5	25.29	32.41	5.6	8.68	31.
6.3	43.73	55.45	6.4	6.54	43.33	6.4	56.93	57.92	6.5	25.23	32.72	6.6	8.98	31.
7.3	42.69	55.57	7.3	6.43	43.53	7.4	56.83	58.18	7.5	25.13	33.05	7.6	9.27	31.
8.3	41.57	55.67	8.3	6.31	43.72	8.4	56.71	58.44	8.5	24.96	33.38	8.6	9.53	31.
9.3	40.39	55.74	9.3	6.17	43.89	9.4	56.57	58.68	9.5	24.73	33.70	9.6	9.75	32.
10.3	39.20	55.78	10.3	6.03	44.03	10.4	56.43	58.90	10.5	24.45	34.02	10.6	9.92	32.
11.3	38.03	55.79	11.3	5.89	44.15	11.4	56.28	59.09	11.5	24.12	34.32	11.6	10.05	32.
12.3	36.92	55.78	12.3	5.75	44.25	12.4	56.14	59.25	12.5	23.77	34.59	12.6	10.15	33
13.3	35.88	55.76	13.3	5.63	44.33	13.4	56.01	59.39	13.5	23.43	34.83	13.6	10.23	33
14.3	34.93	55.75	14.3	5.51	44.41	14.4	55.88	59.53	14.4	23.12	35.07	14.6	10.31	33
15.3	34.02	55.75	15.3	5.40	44.50	15.4	55.76	59.67	15.4	22.86	35.30	15.6	10.40	34
16.3	33.12	55.77	16.3	5.30	44.60	16.4	55.65	59.83	16.4	22.63	35.53	16.6	10.52	34
17.3	32.21	55.80	17.3	5.20	44.72	17.4	55.55	60.01	17.4	22.42	35.78	17.6	10.67	34
18.3	31.25	55.83	18.3	5.09	44.85	18.4	55.44	60.20	18.4	22.22	36.04	18.6	10.84	34
19.3	30.22	55.87	19.3	4.97	44.99	19.4	55.32	60.41	19.4	22.00	36.33	19.6	11.02	35
20.3	29.14	55.91	20.3	4.84	45.13	20.4	55.19	60.61	20.4	21.74	36.63	20.5	11.20	35
21.3	28.01	55.94	21.3	4.70	45.26	21.3	55.04	60.80	21.4	21.43	36.93	21.5	11.36	35
22.3	26.83	55.94	22.3	4.56	45.37	22.3	54.89	60.99	22.4	21.08	37.24	22.5	11.48	36.
23.3	25.63	55.92	23.3	4.41	45.46	23.3	54.74	61.16	23.4	20.68	37.53	23.5	11.57	36.
24.3	24.44	55.88	24.3	4.26	45.53	24.3	54.57	61.31	24.4	20.25	37.81	24.5	11.62	36.
25.3	23.27	55.82	25.3	4.11	45.58	25.3	54.40	61.45	25.4	19.80	38.07	25.5	11.64	37
26.2	22.14	55.75	26.3	3.97	45.61	26.3	54.24	61.56	26.4	19.33	38.32	26.5	11.63	37
27.2	21.07	55.66	27.3	3.83	45.63	27.3	54.08	61.65	27.4	18.85	38.54	27.5	11.61	37
28.2	20.08	55.56	28.3	3.70	45.65	28.3	53.92	61.73	28.4	18.39	38.75	28.5	11.57	38.
29.2	19.14	55.47	29.3	3.58	45.66	29.3	53.78	61.81	29.4	17.96	38.95	29.5	11.55	38.
30.2	18.25	55.39	30.3	3.46	45.68	30.3	53.64	61.89	30.4	17.56	39.14	30.5	11.54	38.
31.2	17.38	55.34	31.3	3.35	45.71	31.3	53.52	61.98	31.4	17.19	39.33	31.5	11.54	38.
	52.04	+52.03		6.94	+6.87		8.21	+8.14		31.43	+31.41		23.48	+23.
	$8^h\ 12^m$	$47^s.195$		$9^h\ 24^m$	$55^s.328$		$10^h\ 20^m$	$42^s.090$		$12^h\ 14^m$	$27^s.330$		$15^h\ 4^m$	$39^s.$
	+88° 53′	33″.49		+81° 42′	28″.51		+82° 59′	48″.65		+88° 10′	35″.93		+87° 33′	52″.

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	8 12	+88 53	May	9 24	+81 42	May	10 20	+83 0	May	12 15	+88 10	May	15 5	+87 33
	s	″		s	″		s	″		s	″		s	″
1.2	77.38	55.34	1.3	63.35	45.71	1.3	53.52	1.98	1.4	17.19	39.33	1.5	11.54	38.90
2.2	76.50	55.29	2.3	63.24	45.76	2.3	53.40	2.08	2.4	16.84	39.53	2.5	11.57	39.17
3.2	75.57	55.25	3.3	63.12	45.82	3.3	53.27	2.20	3.4	16.49	39.74	3.5	11.61	39.46
4.2	74.59	55.21	4.3	62.99	45.88	4.3	53.13	2.32	4.4	16.12	39.97	4.5	11.65	39.76
5.2	73.54	55.15	5.3	62.85	45.93	5.3	52.97	2.45	5.4	15.70	40.21	5.5	11.67	40.08
6.2	72.42	55.07	6.3	62.71	45.96	6.3	52.81	2.56	6.4	15.21	40.46	6.5	11.66	40.42
7.2	71.29	54.96	7.3	62.56	45.96	7.3	52.64	2.64	7.4	14.67	40.70	7.5	11.60	40.78
8.2	70.19	54.82	8.3	62.41	45.94	8.3	52.46	2.69	8.4	14.08	40.91	8.5	11.49	41.12
9.2	69.13	54.65	9.3	62.26	45.89	9.3	52.27	2.72	9.4	13.47	41.09	9.5	11.34	41.45
10.2	68.15	54.47	10.3	62.12	45.82	10.3	52.09	2.73	10.4	12.86	41.24	10.5	11.17	41.76
11.2	67.27	54.29	11.3	61.99	45.74	11.3	51.93	2.73	11.4	12.27	41.38	11.5	10.99	42.05
12.2	66.47	54.11	12.3	61.88	45.66	12.3	51.79	2.72	12.4	11.73	41.50	12.5	10.82	42.32
13.2	65.70	53.96	13.3	61.77	45.60	13.3	51.65	2.72	13.4	11.23	41.62	13.5	10.69	42.57
14.2	64.93	53.83	14.2	61.66	45.56	14.3	51.51	2.74	14.4	10.76	41.75	14.5	10.58	42.82
15.2	64.14	53.71	15.2	61.55	45.54	15.3	51.38	2.77	15.4	10.31	41.90	15.5	10.49	43.09
16.2	63.31	53.60	16.2	61.43	45.53	16.3	51.25	2.81	16.4	9.86	42.07	16.5	10.41	43.37
17.2	62.41	53.49	17.2	61.30	45.51	17.3	51.10	2.86	17.4	9.38	42.25	17.5	10.33	43.66
18.2	61.46	53.37	18.2	61.17	45.48	18.3	50.94	2.92	18.4	8.86	42.43	18.5	10.24	43.96
19.2	60.48	53.22	19.2	61.03	45.44	19.3	50.77	2.96	19.4	8.30	42.61	19.5	10.12	44.28
20.2	59.48	53.05	20.2	60.89	45.39	20.3	50.59	2.99	20.3	7.70	42.78	20.5	9.96	44.62
21.2	58.48	52.87	21.2	60.74	45.32	21.3	50.41	3.00	21.3	7.06	42.94	21.5	9.78	44.95
22.2	57.51	52.67	22.2	60.60	45.22	22.3	50.23	2.99	22.3	6.40	43.09	22.5	9.56	45.27
23.2	56.59	52.45	23.2	60.47	45.11	23.3	50.05	2.96	23.3	5.72	43.22	23.5	9.31	45.58
24.2	55.74	52.21	24.2	60.34	44.98	24.3	49.87	2.90	24.3	5.04	43.32	24.5	9.05	45.88
25.2	54.95	51.97	25.2	60.22	44.84	25.3	49.71	2.83	25.3	4.37	43.40	25.5	8.78	46.16
26.2	54.23	51.73	26.2	60.10	44.70	26.3	49.56	2.75	26.3	3.73	43.47	26.5	8.51	46.41
27.2	53.58	51.50	27.2	59.99	44.57	27.3	49.41	2.67	27.3	3.14	43.53	27.4	8.26	46.65
28.2	52.97	51.29	28.2	59.89	44.44	28.2	49.28	2.60	28.3	2.58	43.58	28.4	8.02	46.87
29.2	52.38	51.09	29.2	59.79	44.32	29.2	49.16	2.54	29.3	2.06	43.64	29.4	7.79	47.09
30.2	51.75	50.91	30.2	59.69	44.22	30.2	49.03	2.50	30.3	1.55	43.72	30.4	7.57	47.33
31.2	51.08	50.73	31.2	59.59	44.12	31.2	48.89	2.47	31.3	1.02	43.81	31.4	7.37	47.57
32.1	50.35	50.54	32.2	59.48	44.03	32.2	48.75	2.44	32.3	0.46	43.91	32.4	7.16	47.83
	52.01	+52.00		6.94	+6.87		8.21	+8.15		31.46	+31.44		23.51	+23.49
	8^h 12^m	$47^s.195$		9^h 24^m	$55^s.328$		10^h 20^m	$42^s.090$		12^h 14^m	$27^s.330$		15^h 4^m	$39^s.67$
	+88° 53′	33″.49		+81° 42′	28″.51		+82° 59′	48″.65		+88° 10′	35″.93		+87° 33′	52″.17

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
June	8 12	+88 53	June	9 24	+81 42	June	10 20	+82 59	June	12 14	+88 10	June	15 4	+87 3
	s	″		s	″		s	″		s	″		s	″
1.1	50.35	50.54	1.2	59.48	44.03	1.2	48.75	62.44	1.3	60.46	43.91	1.4	67.16	47.8
2.1	49.56	50.33	2.2	59.36	43.92	2.2	48.59	62.40	2.3	59.84	44.01	2.4	66.93	48.1
3.1	48.74	50.10	3.2	59.23	43.79	3.2	48.42	62.34	3.3	59.16	44.11	3.4	66.66	48.4
4.1	47.93	49.84	4.2	59.10	43.63	4.2	48.25	62.25	4.3	58.44	44.19	4.4	66.34	48.7
5.1	47.16	49.56	5.2	58.97	43.44	5.2	48.07	62.14	5.3	57.70	44.24	5.4	65.98	48.9
6.1	46.47	49.26	6.2	58.85	43.24	6.2	47.90	62.00	6.3	56.95	44.26	6.4	65.59	49.2
7.1	45.89	48.95	7.2	58.75	43.02	7.2	47.74	61.84	7.3	56.22	44.25	7.4	65.18	49.4
8.1	45.40	48.65	8.2	58.66	42.79	8.2	47.60	61.68	8.3	55.53	44.23	8.4	64.78	49.7
9.1	44.97	48.37	9.2	58.58	42.57	9.2	47.48	61.52	9.3	54.89	44.20	9.4	64.41	49.8
10.1	44.58	48.12	10.2	58.50	42.37	10.2	47.36	61.37	10.3	54.30	44.18	10.4	64.06	50.0
11.1	44.17	47.87	11.2	58.42	42.20	11.2	47.24	61.25	11.3	53.74	44.17	11.4	63.74	50.2
12.1	43.73	47.63	12.2	58.33	42.04	12.2	47.12	61.14	12.3	53.19	44.18	12.4	63.44	50.4
13.1	43.24	47.39	13.2	58.24	41.88	13.2	47.00	61.03	13.3	52.62	44.20	13.4	63.15	50.6
14.1	42.70	47.16	14.2	58.15	41.72	14.2	46.86	60.93	14.3	52.02	44.23	14.4	62.85	50.8
15.1	42.11	46.92	15.2	58.05	41.55	15.2	46.72	60.82	15.3	51.39	44.26	15.4	62.53	51.0
16.1	41.51	46.64	16.2	57.95	41.37	16.2	46.57	60.70	16.3	50.72	44.28	16.4	62.18	51.3
17.1	40.91	46.35	17.2	57.84	41.17	17.2	46.41	60.57	17.3	50.01	44.29	17.4	61.81	51.5
18.1	40.34	46.05	18.2	57.73	40.95	18.2	46.26	60.42	18.3	49.28	44.29	18.4	61.40	51.8
19.1	39.81	45.72	19.2	57.63	40.71	19.2	46.11	60.24	19.3	48.54	44.27	19.4	60.96	52.0
20.1	39.34	45.39	20.1	57.53	40.45	20.2	45.96	60.04	20.3	47.79	44.22	20.4	60.50	52.2
21.1	38.95	45.05	21.1	57.45	40.19	21.2	45.82	59.83	21.3	47.06	44.15	21.4	60.03	52.4
22.1	38.64	44.71	22.1	57.38	39.92	22.2	45.68	59.61	22.3	46.36	44.07	22.4	59.56	52.6
23.1	38.41	44.38	23.1	57.31	39.66	23.2	45.56	59.39	23.3	45.70	43.98	23.4	59.10	52.7
24.1	38.23	44.07	24.1	57.25	39.40	24.2	45.46	59.17	24.3	45.08	43.88	24.4	58.65	52.8
25.1	38.06	43.78	25.1	57.20	39.15	25.2	45.37	58.96	25.3	44.50	43.78	25.4	58.22	52.9
26.1	37.89	43.50	26.1	57.15	38.92	26.2	45.27	58.76	26.2	43.95	43.69	26.4	57.83	53.11
27.1	37.70	43.23	27.1	57.09	38.71	27.2	45.17	58.59	27.2	43.40	43.61	27.4	57.46	53.25
28.1	37.43	42.96	28.1	57.02	38.50	28.2	45.06	58.42	28.2	42.83	43.55	28.4	57.08	53.4
29.1	37.11	42.68	29.1	56.95	38.28	29.2	44.95	58.25	29.2	42.22	43.50	29.4	56.69	53.57
30.1	36.75	42.37	30.1	56.87	38.04	30.2	44.83	58.06	30.2	41.55	43.45	30.4	56.27	53.75
31.1	36.39	42.04	31.1	56.79	37.78	31.2	44.70	57.85	31.2	40.84	43.38	31.4	55.81	53.94
	51.92	+51.91		6.94	+6.86		8.21	+8.15		31.47	+31.45		23.53	+23.51
	$8^{h}\ 12^{m}$	$47^{s}.195$		$9^{h}\ 24^{m}$	$55^{s}.328$		$10^{h}\ 20^{m}$	$42^{s}.090$		$12^{h}\ 14^{m}$	$27^{s}.330$		$15^{h}\ 4^{m}$	$39^{s}.67$
	+88° 53′	33″.49		+81° 42′	28″.51		+82° 59′	48″.65		+88° 10′	35″.93		+87° 33′	52″.17

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	8 12	+88 53	July	9 24	+81 42	July	10 20	+82 59	July	12 14	+88 10	July	15 4	+87 33
	s	″		s	″		s	″		s	″		s	″
1.1	36.39	42.04	1.1	56.79	37.78	1.2	44.70	57.85	1.2	40.84	43.38	1.4	55.81	53.94
2.1	36.07	41.69	2.1	56.71	37.49	2.2	44.56	57.61	2.2	40.10	43.29	2.3	55.31	54.12
3.1	35.82	41.32	3.1	56.63	37.18	3.2	44.43	57.35	3.2	39.35	43.17	3.3	54.78	54.27
4.1	35.65	40.94	4.1	56.57	36.85	4.1	44.31	57.06	4.2	38.62	43.02	4.3	54.23	54.40
5.1	35.60	40.56	5.1	56.52	36.51	5.1	44.21	56.77	5.2	37.93	42.86	5.3	53.67	54.50
6.1	35.63	40.20	6.1	56.48	36.18	6.1	44.12	56.48	6.2	37.29	42.68	6.3	53.12	54.57
7.1	35.70	39.86	7.1	56.45	35.87	7.1	44.04	56.20	7.2	36.70	42.50	7.3	52.61	54.63
8.0	35.78	39.55	8.1	56.42	35.58	8.1	43.96	55.94	8.2	36.15	42.33	8.3	52.12	54.70
9.0	35.84	39.25	9.1	56.40	35.31	9.1	43.89	55.69	9.2	35.62	42.17	9.3	51.66	54.77
10.0	35.86	38.96	10.1	56.37	35.05	10.1	43.82	55.45	10.2	35.10	42.03	10.3	51.21	54.84
11.0	35.83	38.67	11.1	56.33	34.80	11.1	43.74	55.22	11.2	34.56	41.90	11.3	50.77	54.93
12.0	35.76	38.37	12.1	56.28	34.54	12.1	43.65	55.00	12.2	33.98	41.78	12.3	50.32	55.03
13.0	35.66	38.05	13.1	56.23	34.27	13.1	43.55	54.76	13.2	33.37	41.65	13.3	49.85	55.14
14.0	35.55	37.72	14.1	56.17	33.98	14.1	43.44	54.51	14.2	32.73	41.52	14.3	49.35	55.26
15.0	35.46	37.37	15.1	56.12	33.67	15.1	43.34	54.25	15.2	32.07	41.37	15.3	48.83	55.37
16.0	35.41	37.01	16.1	56.07	33.35	16.1	43.23	53.96	16.2	31.40	41.21	16.3	48.29	55.46
17.0	35.41	36.64	17.1	56.03	33.02	17.1	43.13	53.66	17.2	30.72	41.02	17.3	47.72	55.55
18.0	35.49	36.26	18.1	55.99	32.67	18.1	43.04	53.34	18.2	30.05	40.82	18.3	47.13	55.62
19.0	35.64	35.87	19.1	55.97	32.31	19.1	42.96	53.01	19.2	29.41	40.60	19.3	46.54	55.66
20.0	35.88	35.50	20.1	55.96	31.95	20.1	42.90	52.68	20.2	28.82	40.36	20.3	45.96	55.68
21.0	36.18	35.15	21.1	55.95	31.61	21.1	42.84	52.35	21.2	28.27	40.12	21.3	45.40	55.68
22.0	36.51	34.81	22.1	55.95	31.29	22.1	42.79	52.03	22.2	27.76	39.88	22.3	44.87	55.67
23.0	36.85	34.48	23.1	55.96	30.97	23.1	42.76	51.72	23.2	27.29	39.64	23.3	44.37	55.66
24.0	37.17	34.17	24.1	55.96	30.67	24.1	42.72	51.43	24.2	26.83	39.42	24.3	43.89	55.65
25.0	37.44	33.87	25.1	55.96	30.39	25.1	42.68	51.16	25.2	26.37	39.21	25.3	43.42	55.65
25.9	37.65	33.56	26.0	55.95	30.11	26.1	42.62	50.88	26.2	25.88	39.01	26.3	42.94	55.67
26.9	37.81	33.25	27.0	55.93	29.81	27.1	42.56	50.60	27.2	25.34	38.83	27.3	42.43	55.71
27.9	37.94	32.91	28.0	55.91	29.48	28.1	42.49	50.31	28.2	24.76	38.63	28.3	41.89	55.76
28.9	38.10	32.55	29.0	55.89	29.13	29.1	42.42	49.99	29.2	24.14	38.41	29.3	41.31	55.80
29.9	38.32	32.18	30.0	55.87	28.76	30.1	42.34	49.64	30.2	23.51	38.17	30.3	40.70	55.83
30.9	38.61	31.79	31.0	55.86	28.38	31.1	42.27	49.27	31.2	22.89	37.90	31.3	40.08	55.84
31.9	39.01	31.39	32.0	55.86	27.98	32.1	42.22	48.89	32.1	22.30	37.60	32.3	39.45	55.81
	51.80	+51.79		6.93	+6.86		8.20	+8.14		31.45	+31.44		23.53	+23.51
	$8^h\ 12^m$	$47^s.195$		$9^h\ 24^m$	$55^s.328$		$10^h\ 20^m$	$42^s.090$		$12^h\ 14^m$	$27^s.330$		$15^h\ 4^m$	$39^s.67$
	+88° 53′	33″.49		+81° 42′	28″.51		+82° 59′	48″.65		+88° 10′	35″.93		+87° 33′	52″.17

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Aug.	8 12	+88 53	Aug.	9 24	+81 42	Aug.	10 20	+82 59	Aug.	12 14	+88 10	Aug.	15 4	+87 33
	s	"		s	"		s	"		s	"		s	"
1.9	39.51	31.01	1.0	55.86	27.98	1.1	42.22	48.89	1.1	22.30	37.60	1.3	39.45	55.81
2.9	40.07	30.66	2.0	55.88	27.60	2.1	42.19	48.51	2.1	21.77	37.29	2.3	38.83	55.75
3.9	40.64	30.33	3.0	55.91	27.23	3.1	42.17	48.14	3.1	21.30	36.98	3.3	38.25	55.67
4.9	41.20	30.01	4.0	55.94	26.89	4.1	42.16	47.79	4.1	20.88	36.69	4.3	37.71	55.59
5.9	41.72	29.71	5.0	55.98	26.56	5.1	42.16	47.45	5.1	20.49	36.40	5.3	37.19	55.52
6.9	42.21	29.41	6.0	56.01	26.25	6.1	42.15	47.14	6.1	20.11	36.13	6.3	36.69	55.45
7.9	42.65	29.12	7.0	56.04	25.94	7.1	42.13	46.84	7.1	19.72	35.87	7.3	36.20	55.39
8.9	43.04	28.82	8.0	56.06	25.64	8.1	42.11	46.53	8.1	19.31	35.61	8.2	35.70	55.35
9.9	43.42	28.50	9.0	56.07	25.33	9.0	42.08	46.22	9.1	18.87	35.36	9.2	35.19	55.32
10.9	43.81	28.17	10.0	56.08	25.00	10.0	42.04	45.90	10.1	18.40	35.11	10.2	34.66	55.29
11.9	44.23	27.82	11.0	56.09	24.66	11.0	42.00	45.57	11.1	17.90	34.85	11.2	34.11	55.26
12.9	44.69	27.47	12.0	56.10	24.31	12.0	41.96	45.22	12.1	17.39	34.58	12.2	33.54	55.22
13.9	45.21	27.10	12.9	56.11	23.94	13.0	41.93	44.85	13.1	16.87	34.28	13.2	32.94	55.17
14.9	45.81	26.73	13.9	56.14	23.56	14.0	41.90	44.47	14.1	16.37	33.97	14.2	32.33	55.10
15.9	46.48	26.37	14.9	56.18	23.17	15.0	41.88	44.08	15.1	15.90	33.64	15.2	31.71	55.01
16.9	47.24	26.03	15.9	56.22	22.79	16.0	41.88	43.69	16.1	15.47	33.29	16.2	31.11	54.90
17.9	48.04	25.71	16.9	56.27	22.41	17.0	41.89	43.30	17.1	15.08	32.93	17.2	30.53	54.77
18.9	48.86	25.41	17.9	56.33	22.04	18.0	41.91	42.92	18.1	14.74	32.58	18.2	29.97	54.62
19.9	49.66	25.12	18.9	56.40	21.70	19.0	41.94	42.55	19.1	14.44	32.23	19.2	29.44	54.46
20.9	50.43	24.84	19.9	56.47	21.38	20.0	41.98	42.20	20.1	14.17	31.89	20.2	28.94	54.31
21.9	51.13	24.57	20.9	56.54	21.07	21.0	42.01	41.86	21.1	13.91	31.57	21.2	28.45	54.17
22.9	51.76	24.29	21.9	56.59	20.76	22.0	42.03	41.53	22.1	13.63	31.27	22.2	27.97	54.03
23.9	52.34	23.99	22.9	56.64	20.44	23.0	42.04	41.20	23.1	13.31	30.98	23.2	27.47	53.92
24.9	52.94	23.67	23.9	56.68	20.11	24.0	42.04	40.87	24.1	12.94	30.68	24.2	26.95	53.83
25.9	53.58	23.33	24.9	56.71	19.76	25.0	42.04	40.51	25.1	12.53	30.37	25.2	26.40	53.73
26.9	54.30	22.98	25.9	56.75	19.39	26.0	42.04	40.12	26.1	12.11	30.04	26.2	25.81	53.62
27.9	55.12	22.63	26.9	56.80	19.00	27.0	42.03	39.72	27.1	11.69	29.69	27.2	25.20	53.50
28.9	56.02	22.28	27.9	56.86	18.60	27.9	42.04	39.31	28.1	11.29	29.31	28.2	24.57	53.36
29.9	56.99	21.95	28.9	56.93	18.20	28.9	42.07	38.89	29.1	10.94	28.91	29.2	23.97	53.18
30.9	58.00	21.66	29.9	57.02	17.82	29.9	42.12	38.48	30.1	10.66	28.51	30.2	23.40	52.98
31.9	59.00	21.39	30.9	57.11	17.46	30.9	42.17	38.08	31.1	10.43	28.11	31.2	22.86	52.76
32.9	59.97	21.14	31.9	57.20	17.13	31.9	42.24	37.71	32.1	10.25	27.73	32.2	22.35	52.54
	51.65	+51.64		6.93	+6.86		8.20	+8.14		31.42	+31.40		23.53	+23.51
	$8^{h}\ 12^{m}$	$47^{s}.195$		$9^{h}\ 24^{m}$	$55^{s}.328$		$10^{h}\ 20^{m}$	$42^{s}.090$		$12^{h}\ 14^{m}$	$27^{s}.330$		$15^{h}\ 4^{m}$	$39^{s}.67$
	$+88^{\circ}\ 53'$	$33''.49$		$+81^{\circ}\ 42'$	$28''.51$		$+82^{\circ}\ 59'$	$48''.65$		$+88^{\circ}\ 10'$	$35''.93$		$+87^{\circ}\ 33'$	$52''.17$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	8 12	+88 53	Sept.	9 24	+81 42	Sept.	10 20	+82 59	Sept.	12 14	+88 10	Sept.	15 4	+87 33
	s	″		s	″		s	″		s	″		s	″
1.9	59.97	21.14	1.9	57.30	16.82	1.9	42.30	37.36	1.1	10.25	27.73	1.2	22.35	52.54
2.9	60.89	20.89	2.9	57.39	16.52	2.9	42.36	37.03	2.1	10.09	27.37	2.2	21.88	52.33
3.9	61.75	20.65	3.9	57.47	16.22	3.9	42.41	36.70	3.1	9.93	27.02	3.2	21.43	52.13
4.9	62.57	20.41	4.9	57.54	15.92	4.9	42.45	36.37	4.1	9.76	26.68	4.2	20.98	51.94
5.9	63.37	20.15	5.9	57.62	15.61	5.9	42.49	36.04	5.1	9.56	26.35	5.2	20.52	51.77
6.9	64.16	19.87	6.9	57.69	15.28	6.9	42.52	35.69	6.1	9.33	26.02	6.2	20.05	51.60
7.9	64.97	19.59	7.9	57.76	14.94	7.9	42.56	35.33	7.0	9.07	25.69	7.2	19.56	51.45
8.9	65.81	19.30	8.9	57.83	14.59	8.9	42.59	34.95	8.0	8.80	25.35	8.2	19.05	51.29
9.9	66.71	19.00	9.9	57.91	14.23	9.9	42.63	34.56	9.0	8.52	25.00	9.2	18.51	51.11
10.9	67.67	18.70	10.9	57.99	13.87	10.9	42.68	34.16	10.0	8.25	24.62	10.2	17.96	50.92
11.9	68.70	18.40	11.9	58.09	13.50	11.9	42.74	33.77	11.0	8.01	24.22	11.2	17.40	50.71
12.9	69.81	18.12	12.9	58.20	13.14	12.9	42.82	33.37	12.0	7.80	23.81	12.2	16.86	50.48
13.9	70.97	17.86	13.9	58.32	12.80	13.9	42.90	32.97	13.0	7.63	23.40	13.2	16.34	50.23
14.9	72.15	17.62	14.9	58.44	12.48	14.9	43.00	32.59	14.0	7.51	22.98	14.1	15.84	49.96
15.9	73.32	17.40	15.9	58.56	12.18	15.9	43.10	32.23	15.0	7.44	22.57	15.1	15.37	49.68
16.9	74.46	17.20	16.9	58.68	11.89	16.9	43.20	31.90	16.0	7.41	22.17	16.1	14.94	49.40
17.9	75.55	17.01	17.9	58.80	11.61	17.9	43.30	31.58	17.0	7.40	21.79	17.1	14.53	49.13
18.8	76.58	16.82	18.9	58.91	11.33	18.9	43.38	31.26	18.0	7.39	21.43	18.1	14.13	48.86
19.8	77.54	16.61	19.9	59.00	11.05	19.9	43.45	30.94	19.0	7.34	21.07	19.1	13.72	48.62
20.8	78.48	16.38	20.9	59.09	10.75	20.9	43.52	30.60	20.0	7.25	20.72	20.1	13.30	48.40
21.8	79.45	16.12	21.9	59.19	10.42	21.9	43.58	30.23	21.0	7.11	20.36	21.1	12.85	48.19
22.8	80.47	15.85	22.9	59.30	10.07	22.9	43.65	29.84	22.0	6.93	19.99	22.1	12.36	47.97
23.8	81.58	15.58	23.9	59.41	9.72	23.9	43.73	29.44	23.0	6.75	19.60	23.1	11.85	47.73
24.8	82.77	15.32	24.9	59.53	9.37	24.9	43.82	29.04	24.0	6.60	19.18	24.1	11.33	47.47
25.8	84.05	15.07	25.9	59.66	9.03	25.9	43.93	28.64	24.9	6.50	18.75	25.1	10.82	47.19
26.8	85.37	14.85	26.9	59.80	8.71	26.9	44.05	28.26	25.9	6.46	18.31	26.1	10.33	46.88
27.8	86.70	14.66	27.9	59.95	8.42	27.9	44.18	27.90	26.9	6.48	17.88	27.1	9.89	46.55
28.8	88.00	14.50	28.9	60.10	8.15	28.9	44.32	27.56	27.9	6.56	17.46	28.1	9.49	46.22
29.8	89.24	14.35	29.9	60.25	7.90	29.9	44.45	27.25	28.9	6.66	17.06	29.1	9.13	45.90
30.8	90.41	14.21	30.9	60.38	7.65	30.9	44.58	26.96	29.9	6.77	16.68	30.1	8.80	45.58
31.8	91.53	14.06	31.9	60.50	7.41	31.9	44.69	26.66	30.9	6.87	16.31	31.1	8.47	45.28
32.8	92.61	13.90	32.9	60.62	7.17	32.9	44.80	26.35	31.9	6.94	15.95	32.1	8.13	44.99
	51.54	+51.53		6.93	+6.86		8.20	+8.14		31.36	+31.35		23.52	+23.50
	$8^h\ 12^m$	$47^s.195$		$9^h\ 24^m$	$55^s.328$		$10^h\ 20^m$	$42^s.090$		$12^h\ 14^m$	$27^s.330$		$15^h\ 4^m$	$39^s.67$
	$+88^\circ\ 53'$	$33''.49$		$+81^\circ\ 42'$	$28''.51$		$+82^\circ\ 59'$	$48''.65$		$+88^\circ\ 10'$	$35''.93$		$+87^\circ\ 33'$	$52''.17$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	8 13	+88 53	Oct.	9 25	+81 42	Oct.	10 20	+82 59	Oct.	12 14	+88 10	Oct.	15 3	+87 33
	s	″		s	″		s	″		s	″		s	″
1.8	31.53	14.06	1.9	0.50	7.41	1.9	44.69	26.66	1.9	6.94	15.95	1.1	68.47	45.28
2.8	32.61	13.90	2.9	0.62	7.17	2.9	44.80	26.35	2.9	6.99	15.59	2.1	68.13	44.99
3.8	33.68	13.73	3.9	0.74	6.91	3.9	44.90	26.05	3.9	7.01	15.24	3.1	67.79	44.72
4.8	34.75	13.55	4.9	0.86	6.64	4.9	45.00	25.74	4.9	7.01	14.89	4.1	67.43	44.46
5.8	35.85	13.36	5.9	0.98	6.36	5.9	45.09	25.41	5.9	7.01	14.52	5.1	67.05	44.19
6.8	36.98	13.16	6.8	1.10	6.07	6.9	45.20	25.07	6.9	7.01	14.13	6.1	66.65	43.92
7.8	38.17	12.97	7.8	1.23	5.78	7.9	45.32	24.72	7.9	7.03	13.73	7.1	66.24	43.64
8.8	39.42	12.78	8.8	1.37	5.48	8.9	45.44	24.37	8.9	7.09	13.32	8.1	65.83	43.34
9.8	40.74	12.60	9.8	1.52	5.19	9.9	45.57	24.02	9.9	7.18	12.90	9.1	65.43	43.02
10.8	42.11	12.44	10.8	1.68	4.92	10.9	45.72	23.67	10.9	7.31	12.47	10.1	65.04	42.68
11.8	43.51	12.31	11.8	1.85	4.67	11.9	45.88	23.33	11.9	7.50	12.05	11.1	64.68	42.32
12.8	44.92	12.20	12.8	2.02	4.44	12.9	46.04	23.02	12.9	7.73	11.64	12.1	64.36	41.95
13.8	46.30	12.11	13.8	2.19	4.23	13.9	46.20	22.73	13.9	7.98	11.25	13.1	64.07	41.57
14.8	47.61	12.03	14.8	2.35	4.03	14.9	46.36	22.46	14.9	8.24	10.88	14.1	63.81	41.21
15.8	48.86	11.95	15.8	2.50	3.83	15.9	46.51	22.20	15.9	8.49	10.53	15.1	63.57	40.86
16.8	50.05	11.86	16.8	2.64	3.63	16.9	46.66	21.94	16.9	8.70	10.19	16.1	63.33	40.52
17.8	51.20	11.75	17.8	2.78	3.42	17.9	46.79	21.66	17.9	8.86	9.85	17.1	63.07	40.20
18.8	52.35	11.62	18.8	2.92	3.20	18.9	46.91	21.37	18.9	8.99	9.49	18.1	62.80	39.90
19.8	53.53	11.49	19.8	3.06	2.95	19.9	47.04	21.06	19.9	9.10	9.12	19.1	62.50	39.60
20.8	54.78	11.34	20.8	3.21	2.69	20.9	47.17	20.74	20.9	9.22	8.73	20.0	62.17	39.28
21.8	56.11	11.19	21.8	3.37	2.43	21.8	47.32	20.41	21.9	9.37	8.32	21.0	61.82	38.95
22.8	57.52	11.05	22.8	3.54	2.17	22.8	47.48	20.08	22.9	9.57	7.90	22.0	61.48	38.60
23.8	58.97	10.95	23.8	3.72	1.94	23.8	47.66	19.77	23.9	9.84	7.48	23.0	61.16	38.23
24.8	60.45	10.88	24.8	3.90	1.74	24.8	47.84	19.48	24.9	10.17	7.07	24.0	60.88	37.83
25.7	61.90	10.84	25.8	4.09	1.56	25.8	48.03	19.21	25.9	10.54	6.68	25.0	60.65	37.42
26.7	63.30	10.81	26.8	4.27	1.40	26.8	48.22	18.97	26.9	10.93	6.32	26.0	60.46	37.02
27.7	64.64	10.79	27.8	4.45	1.26	27.8	48.41	18.75	27.9	11.32	5.98	27.0	60.30	36.63
28.7	65.91	10.77	28.8	4.62	1.13	28.8	48.58	18.55	28.9	11.69	5.66	28.0	60.16	36.26
29.7	67.12	10.75	29.8	4.78	0.99	29.8	48.74	18.34	29.9	12.03	5.34	29.0	60.03	35.91
30.7	68.29	10.72	30.8	4.94	0.85	30.8	48.90	18.12	30.9	12.33	5.03	30.0	59.89	35.57
31.7	69.45	10.68	31.8	5.09	0.69	31.8	49.06	17.90	31.9	12.61	4.72	31.0	59.73	35.24
32.7	70.62	10.63	32.8	5.24	0.52	32.8	49.21	17.67	32.9	12.88	4.39	32.0	59.56	34.92
	51.47	+51.46		6.93	+6.86		8.19	+8.13		31.31	+31.29		23.50	+23.48
	$8^h\ 12^m$	$47^s.195$		$9^h\ 24^m$	$55^s.328$		$10^h\ 20^m$	$42^s.090$		$12^h\ 14^m$	$27^s.330$		$15^h\ 4^m$	$39^s.67$
	+88° 53′	33″.49		+81° 42′	28″.51		+82° 59′	48″.65		+88° 10′	35″.93		+87° 33′	52″.17

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

…bridge 1119. Mag. 7.0		**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
8 14	+88 53	Nov.	9 25	+81 41	Nov.	10 20	+82 59	Nov.	12 14	+88 9	Nov.	15 3	+87 33
s	″		s	″		s	″		s	″		s	″
10.62	10.63	1.8	5.24	60.52	1.8	49.21	17.67	1.9	12.88	64.39	1.0	59.56	34.92
11.82	10.58	2.8	5.39	60.35	2.8	49.37	17.43	2.9	13.14	64.06	2.0	59.38	34.60
13.07	10.52	3.8	5.55	60.17	3.8	49.53	17.18	3.9	13.42	63.72	3.0	59.17	34.26
14.37	10.47	4.8	5.72	60.00	4.8	49.70	16.92	4.9	13.74	63.36	4.0	58.97	33.91
15.72	10.42	5.8	5.90	59.83	5.8	49.88	16.67	5.9	14.10	63.00	5.0	58.78	33.55
17.12	10.39	6.8	6.08	59.67	6.8	50.07	16.42	6.9	14.50	62.63	6.0	58.59	33.17
18.55	10.39	7.8	6.26	59.53	7.8	50.27	16.19	7.9	14.94	62.27	6.9	58.43	32.77
19.99	10.41	8.8	6.46	59.42	8.8	50.48	15.98	8.9	15.43	61.91	7.9	58.30	32.36
21.40	10.45	9.8	6.66	59.32	9.8	50.69	15.80	9.9	15.94	61.58	8.9	58.21	31.95
22.76	10.50	10.8	6.85	59.24	10.8	50.90	15.64	10.9	16.46	61.27	9.9	58.17	31.54
24.05	10.57	11.8	7.03	59.17	11.8	51.10	15.49	11.9	16.97	60.98	10.9	58.15	31.14
25.26	10.63	12.7	7.20	59.10	12.8	51.29	15.34	12.9	17.45	60.71	11.9	58.14	30.76
26.41	10.68	13.7	7.36	59.03	13.8	51.47	15.19	13.9	17.88	60.44	12.9	58.13	30.40
27.54	10.71	14.7	7.52	58.94	14.8	51.64	15.04	14.9	18.28	60.17	13.9	58.09	30.06
28.68	10.72	15.7	7.68	58.84	15.8	51.80	14.86	15.9	18.67	59.89	14.9	58.02	29.74
29.87	10.71	16.7	7.84	58.73	16.8	51.97	14.66	16.9	19.05	59.58	15.9	57.93	29.40
31.13	10.71	17.7	8.01	58.60	17.8	52.15	14.45	17.9	19.44	59.26	16.9	57.83	29.05
32.47	10.71	18.7	8.19	58.47	18.8	52.34	14.24	18.8	19.88	58.93	17.9	57.72	28.69
33.86	10.73	19.7	8.39	58.36	19.8	52.55	14.04	19.8	20.38	58.59	18.9	57.62	28.30
35.29	10.79	20.7	8.59	58.28	20.8	52.77	13.87	20.8	20.93	58.26	19.9	57.55	27.89
36.70	10.88	21.7	8.78	58.23	21.8	53.00	13.73	21.8	21.53	57.96	20.9	57.53	27.47
38.05	10.99	22.7	8.98	58.21	22.8	53.22	13.61	22.8	22.16	57.68	21.9	57.56	27.05
39.32	11.12	23.7	9.17	58.20	23.8	53.44	13.51	23.8	22.79	57.43	22.9	57.63	26.65
40.51	11.26	24.7	9.36	58.20	24.8	53.65	13.43	24.8	23.41	57.20	23.9	57.73	26.26
41.64	11.40	25.7	9.53	58.21	25.8	53.85	13.37	25.8	24.00	56.98	24.9	57.83	25.89
42.71	11.53	26.7	9.70	58.22	26.7	54.04	13.30	26.8	24.55	56.77	25.9	57.93	25.54
43.74	11.64	27.7	9.86	58.21	27.7	54.22	13.22	27.8	25.08	56.57	26.9	58.01	25.21
44.78	11.74	28.7	10.02	58.19	28.7	54.40	13.13	28.8	25.59	56.36	27.9	58.09	24.90
45.84	11.83	29.7	10.18	58.17	29.7	54.58	13.04	29.8	26.09	56.13	28.9	58.16	24.58
46.92	11.92	30.7	10.34	58.14	30.7	54.76	12.94	30.8	26.58	55.90	29.9	58.22	24.25
48.05	12.01	31.7	10.51	58.11	31.7	54.95	12.83	31.8	27.10	55.66	30.9	58.27	23.92
49.22	12.11	32.7	10.69	58.09	32.7	55.15	12.73	32.8	27.65	55.41	31.9	58.32	23.57
51.45	+51.44		6.93	+6.86		8.19	+8.13		31.26	+31.24		23.47	+23.45
12^m	$47^s.195$		$9^h\ 24^m$	$55^s.328$		$10^h\ 20^m$	$42^s.090$		$12^h\ 14^m$	$27^s.330$		$15^h\ 4^m$	$39^s.67$
53′	33″.49		+81° 42′	28″.51		+82° 59′	48″.65		+88° 10′	35″.93		+87° 33′	52″.17

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Dec.	8 14	+88 53	Dec.	9 25	+81 41	Dec.	10 20	+82 59	Dec.	12 14	+88 9	Dec.	15 3	+8
	s	″		s	″		s	″		s	″		s	
1.6	48.05	12.01	1.7	10.51	58.11	1.7	54.95	12.83	1.8	27.10	55.66	1.9	58.32	23
2.6	49.22	12.11	2.7	10.69	58.09	2.7	55.15	12.73	2.8	27.65	55.41	2.9	58.38	23
3.6	50.43	12.22	3.7	10.87	58.07	3.7	55.36	12.63	3.8	28.24	55.16	3.9	58.46	2
4.6	51.67	12.35	4.7	11.05	58.07	4.7	55.58	12.55	4.8	28.88	54.92	4.9	58.57	2
5.6	52.90	12.51	5.7	11.24	58.10	5.7	55.81	12.48	5.8	29.56	54.69	5.9	58.71	2
6.6	54.11	12.69	6.7	11.43	58.15	6.7	56.04	12.43	6.8	30.27	54.48	6.9	58.89	2
7.6	55.28	12.89	7.7	11.61	58.22	7.7	56.27	12.41	7.8	31.00	54.29	7.9	59.09	2
8.6	56.37	13.10	8.7	11.79	58.31	8.7	56.48	12.41	8.8	31.72	54.12	8.9	59.32	2
9.6	57.38	13.31	9.7	11.96	58.40	9.7	56.68	12.43	9.8	32.41	53.98	9.9	59.57	2
10.6	58.30	13.52	10.7	12.12	58.49	10.7	56.87	12.44	10.8	33.06	53.85	10.9	59.81	2
11.6	59.19	13.70	11.7	12.27	58.57	11.7	57.05	12.44	11.8	33.66	53.72	11.9	60.02	2
12.6	60.07	13.86	12.7	12.42	58.63	12.7	57.23	12.43	12.8	34.22	53.58	12.9	60.19	1
13.6	60.96	14.01	13.7	12.57	58.67	13.7	57.40	12.40	13.8	34.76	53.42	13.9	60.34	1
14.6	61.90	14.15	14.7	12.72	58.70	14.7	57.58	12.36	14.8	35.32	53.25	14.9	60.47	1
15.6	62.92	14.28	15.7	12.88	58.73	15.7	57.78	12.31	15.8	35.91	53.06	15.9	60.60	1
16.6	64.01	14.44	16.7	13.05	58.77	16.7	57.98	12.27	16.8	36.55	52.87	16.9	60.76	1
17.6	65.13	14.62	17.7	13.23	58.84	17.7	58.20	12.25	17.8	37.24	52.69	17.9	60.97	18.
18.6	66.24	14.84	18.7	13.41	58.93	18.7	58.42	12.26	18.8	37.98	52.52	18.9	61.22	17.
19.6	67.29	15.08	19.6	13.59	59.04	19.7	58.64	12.29	19.8	38.76	52.38	19.9	61.52	17.
20.6	68.26	15.34	20.6	13.76	59.19	20.7	58.86	12.35	20.8	39.54	52.27	20.9	61.85	17.
21.6	69.15	15.61	21.6	13.92	59.35	21.7	59.07	12.43	21.8	40.30	52.18	21.9	62.19	16.7
22.6	69.97	15.88	22.6	14.07	59.51	22.7	59.26	12.52	22.8	41.03	52.11	22.9	62.55	16.4
23.6	70.70	16.14	23.6	14.21	59.68	23.7	59.44	12.62	23.8	41.73	52.06	23.9	62.89	16.
24.6	71.39	16.38	24.6	14.34	59.83	24.7	59.62	12.71	24.8	42.39	52.01	24.9	63.21	15.9
25.6	72.05	16.61	25.6	14.47	59.97	25.7	59.79	12.79	25.7	43.02	51.96	25.9	63.51	15.7
26.6	72.71	16.83	26.6	14.60	60.10	26.7	59.95	12.86	26.7	43.63	51.90	26.9	63.80	15.4
27.6	73.39	17.05	27.6	14.73	60.22	27.7	60.12	12.93	27.7	44.24	51.84	27.9	64.07	15.
28.6	74.10	17.27	28.6	14.86	60.35	28.7	60.29	12.99	28.7	44.86	51.77	28.9	64.35	14.9
29.6	74.85	17.48	29.6	15.00	60.48	29.7	60.46	13.05	29.7	45.50	51.69	29.9	64.64	14.7
30.6	75.63	17.71	30.6	15.14	60.61	30.7	60.64	13.11	30.7	46.17	51.61	30.9	64.95	14.4
31.6	76.44	17.96	31.6	15.29	60.76	31.7	60.83	13.18	31.7	46.87	51.52	31.8	65.27	14.1
32.6	77.26	18.23	32.6	15.44	60.92	32.7	61.03	13.27	32.7	47.61	51.45	32.8	65.62	13.8
	51.50	+51.49		6.93	+6.85		8.19	+8.13		31.22	+31.20		23.44	+23.4
	8^h 12^m	$47^s.195$		9^h 24^m	$55^s.328$		10^h 20^m	$42^s.090$		12^h 14^m	$27^s.330$		15^h 4^m	$39^s.6$
	+88° 53′	33″.49		+81° 42′	28″.51		+82° 59′	48″.65		+88° 10′	35″.93		+87° 33′	52″.1

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	16 54	+82 10	Jan.	17 59	+86 36	Jan.	19 4	+89 0	Jan.	20 48	+82 12	Jan.	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
0.9	35.90	32.05	0.9	35.50	39.18	1.0	41.30	40.17	1.1	41.38	54.87	1.2	27.14	19.04
1.9	35.97	31.70	1.9	35.55	38.82	2.0	41.05	39.81	2.1	41.29	54.57	2.2	26.74	18.94
2.9	36.05	31.37	2.9	35.61	38.47	3.0	40.86	39.46	3.1	41.20	54.28	3.2	26.36	18.84
3.9	36.12	31.07	3.9	35.67	38.14	4.0	40.70	39.13	4.1	41.12	54.00	4.2	26.01	18.75
4.9	36.20	30.78	4.9	35.73	37.83	5.0	40.54	38.83	5.1	41.05	53.73	5.2	25.67	18.66
5.9	36.27	30.49	5.9	35.78	37.53	6.0	40.37	38.54	6.1	40.98	53.47	6.2	25.35	18.57
6.9	36.34	30.20	6.9	35.82	37.23	6.9	40.16	38.25	7.1	40.90	53.22	7.2	25.02	18.50
7.9	36.40	29.92	7.9	35.85	36.93	7.9	39.90	37.97	8.1	40.82	52.99	8.2	24.69	18.44
8.9	36.45	29.62	8.9	35.87	36.63	8.9	39.61	37.68	9.1	40.74	52.75	9.2	24.34	18.39
9.9	36.51	29.29	9.9	35.89	36.31	9.9	39.30	37.38	10.1	40.65	52.50	10.2	23.97	18.33
10.9	36.57	28.95	10.9	35.91	35.97	10.9	38.97	37.05	11.1	40.55	52.23	11.2	23.58	18.27
11.9	36.64	28.60	11.9	35.94	35.60	11.9	38.67	36.70	12.1	40.45	51.94	12.2	23.17	18.19
12.9	36.72	28.25	12.9	36.00	35.23	12.9	38.44	36.33	13.1	40.36	51.62	13.2	22.74	18.08
13.9	36.82	27.90	13.9	36.09	34.85	13.9	38.31	35.96	14.1	40.27	51.28	14.2	22.32	17.94
14.9	36.92	27.57	14.9	36.22	34.48	14.9	38.31	35.58	15.0	40.20	50.93	15.2	21.93	17.79
15.9	37.03	27.26	15.9	36.36	34.14	15.9	38.41	35.22	16.0	40.15	50.59	16.2	21.56	17.61
16.9	37.15	26.98	16.9	36.52	33.82	16.9	38.57	34.88	17.0	40.11	50.26	17.2	21.23	17.43
17.9	37.27	26.73	17.9	36.68	33.53	17.9	38.77	34.57	18.0	40.07	49.95	18.2	20.93	17.26
18.9	37.37	26.50	18.9	36.82	33.26	18.9	38.94	34.28	19.0	40.04	49.66	19.1	20.65	17.10
19.9	37.47	26.27	19.9	36.95	33.00	19.9	39.07	34.00	20.0	40.01	49.39	20.1	20.38	16.96
20.9	37.56	26.04	20.9	37.07	32.74	20.9	39.14	33.73	21.0	39.97	49.13	21.1	20.10	16.82
21.9	37.64	25.79	21.9	37.18	32.47	21.9	39.15	33.45	22.0	39.92	48.86	22.1	19.79	16.70
22.9	37.73	25.53	22.9	37.28	32.18	22.9	39.15	33.15	23.0	39.86	48.58	23.1	19.47	16.57
23.9	37.82	25.24	23.9	37.39	31.87	23.9	39.16	32.83	24.0	39.80	48.27	24.1	19.13	16.44
24.9	37.92	24.94	24.9	37.51	31.54	24.9	39.21	32.49	25.0	39.74	47.95	25.1	18.77	16.28
25.9	38.04	24.65	25.9	37.67	31.20	25.9	39.36	32.13	26.0	39.69	47.60	26.1	18.40	16.09
26.9	38.17	24.36	26.9	37.86	30.86	26.9	39.60	31.78	27.0	39.66	47.24	27.1	18.04	15.87
27.9	38.30	24.08	27.9	38.07	30.53	27.9	39.93	31.42	28.0	39.63	46.87	28.1	17.70	15.64
28.8	38.44	23.83	28.9	38.30	30.23	28.9	40.32	31.07	29.0	39.61	46.50	29.1	17.39	15.40
29.8	38.58	23.61	29.9	38.54	29.94	29.9	40.78	30.74	30.0	39.60	46.14	30.1	17.10	15.14
30.8	38.73	23.41	30.9	38.79	29.67	30.9	41.30	30.43	31.0	39.60	45.80	31.1	16.84	14.89
31.8	38.87	23.22	31.9	39.04	29.43	31.9	41.83	30.14	32.0	39.61	45.47	32.1	16.61	14.65
32.8	39.01	23.04	32.9	39.28	29.19	32.9	42.36	29.87	33.0	39.62	45.16	33.1	16.38	14.41
	7.34	+7.28		16.91	+16.88		57.87	+57.86		7.38	+7.31		18.13	+18.10
	$16^h 54^m$	$44^s.256$		$17^h 59^m$	$59^s.80$		$19^h 6^m$	$14^s.74$		$20^h 48^m$	$52^s.975$		$23^h 27^m$	$44^s.908$
	+82° 10′	49″.69		+86° 36′	51″.16		+89° 0′	45″.46		+82° 12′	49″.40		+86° 49′	59″.29

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	De na *No*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Feb.	16 54	+82 10	Feb.	17 59	+86 36	Feb.	19 4	+89 0	Feb.	20 48	+82 12	Feb.	23 27	+86
	s	″		s	″		s	″		s	″		s	″
1.8	39.01	23.04	1.9	39.28	29.19	1.9	42.36	29.87	1.0	39.61	45.47	1.1	16.61	14
2.8	39.14	22.87	2.9	39.51	28.97	2.9	42.86	29.60	2.0	39.62	45.16	2.1	16.38	14
3.8	39.27	22.71	3.9	39.73	28.76	3.9	43.32	29.34	2.9	39.63	44.86	3.1	16.16	14
4.8	39.39	22.53	4.9	39.93	28.53	4.9	43.73	29.08	3.9	39.63	44.56	4.1	15.95	13
5.8	39.51	22.35	5.9	40.13	28.29	5.9	44.10	28.81	4.9	39.64	44.27	5.1	15.73	13
6.8	39.63	22.15	6.9	40.32	28.04	6.9	44.44	28.52	5.9	39.63	43.98	6.1	15.49	13
7.8	39.76	21.93	7.9	40.52	27.77	7.9	44.79	28.22	6.9	39.62	43.68	7.1	15.24	13
8.8	39.89	21.71	8.9	40.74	27.49	8.9	45.21	27.91	7.9	39.61	43.36	8.1	14.96	13
9.8	40.04	21.49	9.9	40.98	27.21	9.9	45.71	27.59	8.9	39.59	43.03	9.1	14.67	12
10.8	40.19	21.29	10.9	41.25	26.94	10.9	46.30	27.26	9.9	39.58	42.67	10.1	14.38	12
11.8	40.35	21.12	11.9	41.56	26.68	11.9	47.00	26.94	10.9	39.60	42.30	11.1	14.11	12
12.8	40.52	20.98	12.9	41.88	26.45	12.9	47.79	26.65	11.9	39.62	41.93	12.1	13.87	12
13.8	40.69	20.86	13.9	42.20	26.26	13.9	48.63	26.38	12.9	39.65	41.57	13.1	13.67	11
14.8	40.85	20.76	14.8	42.52	26.09	14.9	49.46	26.15	13.9	39.70	41.24	14.1	13.51	11
15.8	41.00	20.68	15.8	42.82	25.94	15.9	50.25	25.94	14.9	39.75	40.94	15.1	13.38	11
16.8	41.15	20.61	16.8	43.09	25.80	16.9	50.98	25.73	15.9	39.81	40.65	16.1	13.26	10
17.8	41.29	20.52	17.8	43.34	25.65	17.9	51.63	25.53	16.9	39.85	40.38	17.1	13.14	10
18.8	41.42	20.41	18.8	43.59	25.48	18.9	52.25	25.31	17.9	39.89	40.11	18.1	13.01	10
19.8	41.55	20.28	19.8	43.84	25.30	19.9	52.85	25.08	18.9	39.92	39.84	19.1	12.85	10
20.8	41.69	20.15	20.8	44.11	25.10	20.9	53.48	24.83	19.9	39.94	39.56	20.1	12.67	9
21.8	41.84	20.01	21.8	44.40	24.89	21.9	54.19	24.56	20.9	39.97	39.25	21.1	12.48	9
22.8	42.00	19.88	22.8	44.71	24.68	22.9	54.98	24.28	21.9	40.00	38.92	22.1	12.29	9
23.8	42.16	19.77	23.8	45.05	24.48	23.9	55.87	24.01	22.9	40.04	38.58	23.1	12.10	9
24.8	42.34	19.68	24.8	45.41	24.30	24.9	56.83	23.75	23.9	40.09	38.22	24.1	11.92	8.
25.8	42.52	19.61	25.8	45.77	24.14	25.9	57.85	23.51	24.9	40.15	37.88	25.0	11.77	8.
26.8	42.70	19.56	26.8	46.15	24.00	26.9	58.92	23.29	25.9	40.23	37.55	26.0	11.66	8.0
27.8	42.88	19.54	27.8	46.52	23.88	27.9	60.01	23.09	26.9	40.32	37.23	27.0	11.57	7.7
28.8	43.05	19.53	28.8	46.89	23.79	28.9	61.09	22.91	27.9	40.41	36.94	28.0	11.50	7.3
29.8	43.21	19.53	29.8	47.23	23.71	29.9	62.13	22.75	28.9	40.50	36.65	29.0	11.45	7.0
30.8	43.37	19.54	30.8	47.56	23.64	30.9	63.12	22.60	29.9	40.60	36.38	30.0	11.42	6.7
	7.34	+7.27		16.90	+16.87		57.72	+57.71		7.38	+7.31		18.12	+18.09
	16h 54m	44s.256		17h 59m	59s.80		19h 6m	14s.74		20h 48m	52s.975		23h 27m	44s.90
	+82° 10′	49″.69		+86° 36′	51″.16		+89° 0′	45″.46		+82° 12′	49″.40		+86° 49′	59″.29

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			δ Ursæ Minoris. Mag. 4.4			λ Ursæ Minoris. Mag. 6.6			76 Draconis. Mag. 5.7			39 H. Cephei. Mag. 5.6		
	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
r.	16 54	+82 10	Mar.	17 59	+86 36	Mar.	19 5	+89 0	Mar.	20 48	+82 12	Mar.	23 27	+86 49
	s	″		s	″		s	″		s	″		s	″
1.8	43.21	19.53	1.8	47.23	23.71	1.9	2.13	22.75	1.9	40.60	36.38	1.0	11.45	67.06
2.8	43.37	19.54	2.8	47.56	23.64	2.8	3.12	22.60	2.9	40.69	36.13	2.0	11.42	66.75
3.8	43.52	19.55	3.8	47.88	23.57	3.8	4.07	22.45	3.9	40.77	35.89	3.0	11.40	66.45
4.8	43.66	19.54	4.8	48.19	23.49	4.8	4.98	22.31	4.9	40.85	35.65	4.0	11.37	66.17
5.8	43.80	19.52	5.8	48.48	23.40	5.8	5.84	22.15	5.9	40.91	35.41	5.0	11.33	65.90
.7	43.94	19.48	6.8	48.78	23.30	6.8	6.68	21.98	6.9	40.98	35.16	6.0	11.27	65.64
7.7	44.09	19.43	7.8	49.09	23.18	7.8	7.54	21.79	7.9	41.04	34.89	7.0	11.19	65.37
.7	44.24	19.39	8.8	49.42	23.05	8.8	8.47	21.59	8.9	41.11	34.60	8.0	11.09	65.08
.7	44.41	19.36	9.8	49.78	22.93	9.8	9.49	21.39	9.9	41.19	34.30	9.0	11.00	64.77
.7	44.59	19.35	10.8	50.16	22.82	10.8	10.60	21.19	10.9	41.29	34.01	10.0	10.92	64.44
.7	44.77	19.37	11.8	50.55	22.74	11.8	11.79	21.02	11.9	41.39	33.72	11.0	10.87	64.09
.7	44.94	19.42	12.8	50.95	22.70	12.8	13.04	20.88	12.9	41.51	33.45	12.0	10.86	63.74
.7	45.11	19.50	13.8	51.34	22.69	13.8	14.30	20.77	13.9	41.65	33.22	13.0	10.88	63.39
.7	45.27	19.59	14.8	51.71	22.69	14.8	15.50	20.69	14.9	41.78	33.02	14.0	10.93	63.06
5.7	45.41	19.69	15.8	52.06	22.71	15.8	16.63	20.63	15.9	41.90	32.84	14.9	11.01	62.74
.7	45.55	19.79	16.8	52.38	22.74	16.8	17.69	20.57	16.9	42.01	32.66	15.9	11.10	62.45
.7	45.68	19.87	17.8	52.69	22.75	17.8	18.70	20.50	17.9	42.12	32.49	16.9	11.18	62.18
.7	45.81	19.93	18.8	52.99	22.74	18.8	19.67	20.41	18.9	42.22	32.30	17.9	11.24	61.91
.7	45.95	19.98	19.8	53.30	22.71	19.8	20.64	20.31	19.9	42.32	32.10	18.9	11.27	61.65
.7	46.10	20.02	20.8	53.62	22.67	20.8	21.65	20.20	20.9	42.41	31.88	19.9	11.28	61.38
1.7	46.25	20.07	21.8	53.97	22.62	21.8	22.73	20.08	21.9	42.51	31.65	20.9	11.29	61.09
2.7	46.41	20.13	22.7	54.33	22.59	22.8	23.89	19.96	22.9	42.63	31.41	21.9	11.31	60.78
3.7	46.58	20.20	23.7	54.72	22.57	23.8	25.12	19.85	23.9	42.76	31.17	22.9	11.34	60.46
4.7	46.75	20.30	24.7	55.12	22.57	24.8	26.42	19.75	24.9	42.89	30.94	23.9	11.38	60.12
5.7	46.92	20.43	25.7	55.53	22.60	25.8	27.76	19.67	25.9	43.04	30.73	24.9	11.46	59.78
6.7	47.09	20.58	26.7	55.93	22.65	26.8	29.11	19.62	26.9	43.19	30.54	25.9	11.56	59.43
7.7	47.25	20.74	27.7	56.32	22.72	27.8	30.44	19.60	27.9	43.35	30.37	26.9	11.69	59.09
8.7	47.40	20.91	28.7	56.69	22.81	28.8	31.73	19.60	28.9	43.50	30.22	27.9	11.84	58.77
29.7	47.54	21.10	29.7	57.05	22.91	29.8	32.99	19.61	29.8	43.64	30.09	28.9	12.01	58.47
30.7	47.67	21.29	30.7	57.39	23.01	30.8	34.18	19.62	30.8	43.79	29.98	29.9	12.19	58.18
31.7	47.79	21.46	31.7	57.71	23.11	31.8	35.30	19.64	31.8	43.93	29.87	30.9	12.37	57.91
32.7	47.91	21.61	32.7	58.01	23.20	32.8	36.37	19.64	32.8	44.06	29.76	31.9	12.53	57.66
	7.34	+7.27		16.89	+16.86		57.63	+57.62		7.38	+7.31		18.11	+18.08
	16^h 54^m	$44^s.256$		17^h 59^m	$59^s.80$		19^h 6^m	$14^s.74$		20^h 48^m	$52^s.975$		23^h 27^m	$44^s.908$
	+82° 10′	49″.69		+86° 36′	51″.16		+89° 0′	45″.46		+82° 12′	49″.40		+86° 49′	59″.29

APPARENT PLACES OF CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Ceph** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	
Apr.	16 54	+82 10	Apr.	17 59	+86 36	Apr.	19 5	+89 .0	Apr.	20 48	+82 12	Apr.	23 27	+
	s	″		s	″		s	″		s	″		s	
1.7	47.91	21.61	1.7	58.01	23.20	1.8	36.37	19.64	1.8	44.06	29.76	1.9	12.68	[illegible]
2.7	48.04	21.75	2.7	58.30	23.27	2.8	37.39	19.64	2.8	44.18	29.65	2.9	12.81	[illegible]
3.7	48.16	21.88	3.7	58.60	23.33	3.8	38.42	19.62	3.8	44.30	29.52	3.9	12.93	[illegible]
4.7	48.28	22.01	4.7	58.92	23.38	4.8	39.48	19.58	4.8	44.43	29.38	4.9	13.03	[illegible]
5.7	48.41	22.14	5.7	59.25	23.43	5.8	40.61	19.55	5.8	44.56	29.23	5.9	13.15	[illegible]
6.7	48.55	22.28	6.7	59.61	23.48	6.8	41.81	19.52	6.8	44.71	29.07	6.9	13.29	[illegible]
7.7	48.70	22.45	7.7	59.98	23.55	7.8	43.09	19.51	7.8	44.86	28.92	7.9	13.45	[illegible]
8.7	48.85	22.65	8.7	60.35	23.67	8.7	44.42	19.52	8.8	45.02	28.79	8.9	13.65	[illegible]
9.7	48.98	22.88	9.7	60.72	23.82	9.7	45.76	19.56	9.8	45.19	28.69	9.9	13.89	[illegible]
10.7	49.11	23.13	10.7	61.07	23.99	10.7	47.06	19.64	10.8	45.36	28.62	10.9	14.16	[illegible]
11.6	49.23	23.39	11.7	61.39	24.17	11.7	48.28	19.74	11.8	45.53	28.58	11.9	14.43	[illegible]
12.6	49.33	23.65	12.7	61.68	24.36	12.7	49.42	19.84	12.8	45.69	28.56	12.9	14.70	[illegible]
13.6	49.43	23.89	13.7	61.95	24.54	13.7	50.47	19.95	13.8	45.84	28.54	13.9	14.95	[illegible]
14.6	49.52	24.11	14.7	62.21	24.70	14.7	51.47	20.05	14.8	45.98	28.51	14.9	15.19	[illegible]
15.6	49.60	24.31	15.7	62.46	24.85	15.7	52.45	20.12	15.8	46.11	28.48	15.9	15.40	53
16.6	49.70	24.51	16.7	62.73	24.98	16.7	53.44	20.17	16.8	46.25	28.43	16.9	15.60	53
17.6	49.81	24.69	17.7	63.02	25.11	17.7	54.47	20.22	17.8	46.38	28.36	17.9	15.79	53
18.6	49.92	24.88	18.7	63.32	25.23	18.7	55.58	20.27	18.8	46.53	28.29	18.9	15.99	53
19.6	50.04	25.09	19.7	63.64	25.37	19.7	56.75	20.31	19.8	46.68	28.21	19.9	16.21	52.
20.6	50.16	25.33	20.7	63.97	25.52	20.7	57.97	20.37	20.8	46.84	28.14	20.9	16.45	52.
21.6	50.28	25.58	21.7	64.29	25.69	21.7	59.23	20.46	21.8	47.01	28.08	21.9	16.72	52.
22.6	50.40	25.85	22.7	64.62	25.89	22.7	60.50	20.57	22.8	47.19	28.04	22.9	17.02	52.
23.6	50.50	26.14	23.7	64.94	26.12	23.7	61.76	20.70	23.8	47.36	28.03	23.9	17.34	51.
24.6	50.60	26.44	24.7	65.24	26.35	24.7	62.97	20.85	24.8	47.54	28.05	24.9	17.67	51.
25.6	50.69	26.75	25.7	65.52	26.60	25.7	64.13	21.01	25.8	47.72	28.08	25.9	18.01	51.
26.6	50.78	27.06	26.7	65.78	26.85	26.7	65.22	21.18	26.8	47.89	28.12	26.9	18.35	51.
27.6	50.85	27.36	27.7	66.02	27.10	27.7	66.25	21.36	27.8	48.05	28.17	27.9	18.68	51.
28.6	50.91	27.65	28.6	66.23	27.34	28.7	67.20	21.53	28.8	48.21	28.24	28.9	18.99	51.
29.6	50.97	27.92	29.6	66.44	27.56	29.7	68.09	21.69	29.8	48.35	28.30	29.9	19.29	50.
30.6	51.04	28.17	30 6	66.65	27.76	30.7	68.94	21.84	30.8	48.49	28.34	30.9	19.57	50.
31.6	51.10	28.41	31.6	66.86	27.96	31.7	69.81	21.97	31.8	48.62	28.37	31.9	19.83	50.
	7.34	+7.28		16.90	+16.87		57.62	+57.61		7.38	+7.31		18.09	+18.0
16^h	54^m	$44^s.256$	17^h	59^m	$59^s.80$	19^h	6^m	$14^s.74$	20^h	48^m	$52^s.975$	23^h	27^m	$44^s.9$
+82°	10′	49″.69	+86°	36′	51″.16	+89°	0′	45″.46	+82°	12′	49″.40	+86°	49′	59″.2

[Eph 14]

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	16 54	+82 10	May	18 0	+86 36	May	19 6	+89 0	May	20 48	+82 12	May	23 27	+86 49
	s	″		s	″		s	″		s	″		s	″
1.6	51.10	28.41	1.6	6.86	27.96	1.7	9.81	21.97	1.8	48.62	28.37	1.9	19.83	50.64
2.6	51.17	28.65	2.6	7.08	28.15	2.7	10.73	22.10	2.8	48.76	28.39	2.9	20.09	50.48
3.6	51.25	28.89	3.6	7.32	28.34	3.7	11.71	22.22	3.8	48.91	28.40	3.9	20.36	50.31
4.6	51.33	29.15	4.6	7.57	28.54	4.7	12.76	22.35	4.7	49.07	28.42	4.9	20.66	50.12
5.6	51.41	29.44	5.6	7.84	28.78	5.7	13.85	22.51	5.7	49.24	28.46	5.9	20.98	49.93
6.6	51.49	29.77	6.6	8.10	29.04	6.7	14.96	22.70	6.7	49.42	28.52	6.9	21.33	49.76
7.6	51.56	30.11	7.6	8.34	29.33	7.7	16.03	22.92	7.7	49.59	28.60	7.9	21.72	49.61
8.6	51.62	30.46	8.6	8.55	29.63	8.7	17.03	23.16	8.7	49.76	28.72	8.8	22.13	49.48
9.6	51.66	30.82	9.6	8.74	29.94	9.7	17.94	23.41	9.7	49.93	28.86	9.8	22.54	49.39
10.6	51.69	31.16	10.6	8.90	30.26	10.7	18.75	23.66	10.7	50.09	29.02	10.8	22.93	49.32
11.6	51.72	31.48	11.6	9.04	30.55	11.7	19.47	23.90	11.7	50.23	29.17	11.8	23.30	49.26
12.6	51.74	31.78	12.6	9.16	30.82	12.7	20.14	24.13	12.7	50.36	29.31	12.8	23.64	49.20
13.6	51.76	32.06	13.6	9.29	31.07	13.7	20.80	24.34	13.7	50.49	29.43	13.8	23.96	49.13
14.6	51.79	32.32	14.6	9.44	31.32	14.7	21.50	24.53	14.7	50.62	29.54	14.8	24.26	49.06
15.6	51.83	32.59	15.6	9.59	31.55	15.6	22.26	24.72	15.7	50.76	29.64	15.8	24.56	48.97
16.6	51.88	32.87	16.6	9.76	31.79	16.6	23.07	24.90	16.7	50.90	29.72	16.8	24.88	48.86
17.6	51.93	33.17	17.6	9.95	32.04	17.6	23.93	25.10	17.7	51.04	29.81	17.8	25.22	48.74
18.5	51.98	33.47	18.6	10.14	32.32	18.6	24.82	25.31	18.7	51.20	29.92	18.8	25.58	48.63
19.5	52.03	33.80	19.6	10.33	32.61	19.6	25.74	25.54	19.7	51.36	30.04	19.8	25.97	48.52
20.5	52.07	34.16	20.6	10.51	32.92	20.6	26.63	25.80	20.7	51.53	30.19	20.8	26.37	48.42
21.5	52.10	34.51	21.6	10.67	33.26	21.6	27.48	26.07	21.7	51.69	30.35	21.8	26.78	48.34
22.5	52.12	34.87	22.6	10.81	33.60	22.6	28.28	26.35	22.7	51.85	30.54	22.8	27.21	48.29
23.5	52.13	35.24	23.6	10.93	33.94	23.6	29.00	26.65	23.7	52.01	30.74	23.8	27.64	48.26
24.5	52.13	35.60	24.6	11.02	34.28	24.6	29.64	26.95	24.7	52.16	30.96	24.8	28.06	48.25
25.5	52.12	35.93	25.6	11.09	34.60	25.6	30.20	27.25	25.7	52.30	31.18	25.8	28.46	48.25
26.5	52.11	36.25	26.6	11.15	34.92	26.6	30.69	27.54	26.7	52.42	31.40	26.8	28.84	48.27
27.5	52.10	36.55	27.6	11.20	35.22	27.6	31.12	27.81	27.7	52.54	31.60	27.8	29.20	48.29
28.5	52.09	36.83	28.6	11.25	35.49	28.6	31.56	28.05	28.7	52.66	31.79	28.8	29.53	48.30
29.5	52.09	37.10	29.6	11.31	35.75	29.6	32.02	28.29	29.7	52.77	31.97	29.8	29.85	48.29
30.5	52.08	37.37	30.6	11.38	36.01	30.6	32.54	28.53	30.7	52.89	32.14	30.8	30.18	48.28
31.5	52.09	37.66	31.6	11.48	36.29	31.6	33.12	28.76	31.7	53.02	32.30	31.8	30.53	48.25
32.5	52.10	37.97	32.6	11.58	36.59	32.6	33.75	29.01	32.7	53.15	32.48	32.8	30.90	48.21
	7.35	+7.28		16.91	+16.88		57.70	+57.69		7.38	+7.31		18.09	+18.06
	$16^{\rm h}$ $54^{\rm m}$	$44^{\rm s}.256$		$17^{\rm h}$ $59^{\rm m}$	$59^{\rm s}.80$		$19^{\rm h}$ $6^{\rm m}$	$14^{\rm s}.74$		$20^{\rm h}$ $48^{\rm m}$	$52^{\rm s}.975$		$23^{\rm h}$ $27^{\rm m}$	$44^{\rm s}.908$
	+82° 10′	49″.69		+86° 36′	51″.16		+89° 0′	45″.46		+82° 12′	49″.40		+86° 49′	59″.29

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	16 54	+82 10	June	18 0	+86 36	June	19 6	+89 0	June	20 48	+82 12	June	23 27	+86 49
	s	″		s	″		s	″		s	″		s	″
1.5	52.10	37.97	1.6	11.58	36.59	1.6	33.75	29.01	1.7	53.15	32.48	1.8	30.90	48.21
2.5	52.11	38.31	2.6	11.68	36.91	2.6	34.40	29.29	2.7	53.30	32.67	2.8	31.30	48.19
3.5	52.10	38.67	3.6	11.77	37.25	3.6	35.02	29.60	3.7	53.45	32.89	3.8	31.73	48.18
4.5	52.09	39.04	4.5	11.83	37.61	4.6	35.57	29.93	4.7	53.59	33.15	4.8	32.18	48.20
5.5	52.06	39.41	5.5	11.86	37.98	5.6	36.04	30.28	5.7	53.72	33.44	5.8	32.63	48.25
6.5	52.02	39.77	6.5	11.86	38.35	6.6	36.39	30.63	6.7	53.84	33.73	6.8	33.07	48.33
7.5	51.96	40.10	7.5	11.83	38.71	7.6	36.65	30.97	7.7	53.96	34.02	7.8	33.48	48.42
8.5	51.91	40.42	8.5	11.79	39.04	8.6	36.85	31.29	8.7	54.06	34.30	8.8	33.86	48.52
9.5	51.86	40.71	9.5	11.74	39.35	9.6	37.01	31.60	9.7	54.15	34.58	9.8	34.22	48.62
10.5	51.81	40.98	10.5	11.70	39.64	10.6	37.18	31.89	10.6	54.23	34.83	10.8	34.56	48.71
11.5	51.76	41.24	11.5	11.68	39.92	11.6	37.38	32.16	11.6	54.32	35.06	11.8	34.88	48.78
12.5	51.73	41.52	12.5	11.68	40.19	12.6	37.63	32.42	12.6	54.42	35.30	12.8	35.22	48.84
13.5	51.71	41.80	13.5	11.69	40.48	13.6	37.94	32.69	13.6	54.53	35.53	13.7	35.57	48.89
14.5	51.68	42.10	14.5	11.70	40.78	14.6	38.30	32.97	14.6	54.64	35.75	14.7	35.94	48.93
15.5	51.65	42.41	15.5	11.72	41.09	15.6	38.67	33.28	15.6	54.76	35.99	15.7	36.32	48.98
16.5	51.61	42.75	16.5	11.73	41.43	16.6	39.03	33.60	16.6	54.88	36.26	16.7	36.73	49.04
17.5	51.57	43.10	17.5	11.73	41.79	17.6	39.36	33.94	17.6	55.00	36.55	17.7	37.16	49.11
18.5	51.52	43.44	18.5	11.70	42.15	18.6	39.63	34.29	18.6	55.12	36.85	18.7	37.59	49.20
19.5	51.46	43.78	19.5	11.65	42.51	19.6	39.82	34.64	19.6	55.23	37.17	19.7	38.02	49.32
20.5	51.39	44.11	20.5	11.58	42.87	20.6	39.94	35.01	20.6	55.32	37.50	20.7	38.43	49.46
21.5	51.31	44.43	21.5	11.48	43.22	21.5	39.97	35.37	21.6	55.41	37.84	21.7	38.83	49.62
22.5	51.22	44.74	22.5	11.36	43.56	22.5	39.93	35.72	22.6	55.49	38.17	22.7	39.21	49.79
23.5	51.14	45.02	23.5	11.23	43.88	23.5	39.83	36.05	23.6	55.56	38.49	23.7	39.57	49.96
24.4	51.05	45.27	24.5	11.10	44.17	24.5	39.70	36.36	24.6	55.62	38.80	24.7	39.90	50.13
25.4	50.97	45.51	25.5	10.98	44.45	25.5	39.57	36.66	25.6	55.68	39.10	25.7	40.21	50.29
26.4	50.89	45.75	26.5	10.87	44.72	26.5	39.48	36.95	26.6	55.74	39.39	26.7	40.52	50.44
27.4	50.82	45.99	27.5	10.78	44.99	27.5	39.46	37.23	27.6	55.81	39.66	27.7	40.83	50.57
28.4	50.76	46.25	28.5	10.70	45.27	28.5	39.50	37.51	28.6	55.89	39.93	28.7	41.17	50.69
29.4	50.69	46.53	29.5	10.63	45.58	29.5	39.57	37.82	29.6	55.97	40.22	29.7	41.53	50.81
30.4	50.62	46.84	30.5	10.55	45.91	30.5	39.63	38.16	30.6	56.06	40.53	30.7	41.92	50.95
31.4	50.54	47.16	31.5	10.45	46.26	31.5	39.65	38.52	31.6	56.16	40.87	31.7	42.32	51.11
	7.35	+7.28		16.92	+16.89		57.83	+57.82		7.38	+7.31		18.09	+18.06
	$16^h\ 54^m$	$44^s.256$		$17^h\ 59^m$	$59^s.80$		$19^h\ 6^m$	$14^s.74$		$20^h\ 48^m$	$52^s.975$		$23^h\ 27^m$	$44^s.908$
	+82° 10′	49″.69		+86° 36′	51″.16		+89° 0′	45″.46		+82° 12′	49″.40		+86° 49′	59″.29

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**89 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	16 54	+82 10	July	18 0	+86 36	July	19 6	+89 0	July	20 48	+82 12	July	23 27	+86 49
	s	″		s	″		s	″		s	″		s	″
1.4	50.54	47.16	1.5	10.45	46.26	1.5	39.65	38.52	1.6	56.16	40.87	1.7	42.32	51.11
2.4	50.45	47.48	2.5	10.32	46.63	2.5	39.58	38.90	2.6	56.24	41.23	2.7	42.74	51.30
3.4	50.35	47.79	3.5	10.16	47.00	3.5	39.40	39.29	3.6	56.31	41.61	3.7	43.15	51.52
4.4	50.23	48.08	4.5	9.97	47.35	4.5	39.12	39.67	4.6	56.37	42.00	4.7	43.53	51.75
5.4	50.10	48.34	5.5	9.76	47.66	5.5	38.76	40.03	5.6	56.41	42.39	5.7	43.88	52.00
6.4	49.98	48.58	6.5	9.54	47.96	6.5	38.35	40.37	6.6	56.44	42.76	6.7	44.20	52.25
7.4	49.86	48.80	7.5	9.33	48.24	7.5	37.92	40.68	7.6	56.47	43.10	7.7	44.50	52.49
8.4	49.75	49.01	8.5	9.13	48.50	8.5	37.52	40.97	8.6	56.49	43.42	8.7	44.77	52.71
9.4	49.64	49.21	9.5	8.94	48.75	9.5	37.17	41.26	9.6	56.52	43.74	9.7	45.04	52.93
10.4	49.54	49.42	10.4	8.77	49.01	10.5	36.87	41.55	10.6	56.56	44.04	10.7	45.33	53.13
11.4	49.45	49.65	11.4	8.62	49.27	11.5	36.62	41.84	11.6	56.60	44.34	11.7	45.63	53.31
12.4	49.36	49.89	12.4	8.47	49.55	12.5	36.40	42.14	12.6	56.65	44.66	12.7	45.95	53.49
13.4	49.26	50.14	13.4	8.32	49.85	13.5	36.18	42.46	13.6	56.71	44.99	13.7	46.28	53.69
14.4	49.15	50.40	14.4	8.15	50.16	14.5	35.93	42.80	14.6	56.76	45.34	14.7	46.63	53.91
15.4	49.04	50.67	15.4	7.97	50.48	15.5	35.64	43.15	15.6	56.81	45.70	15.7	46.99	54.13
16.4	48.92	50.93	16.4	7.76	50.80	16.5	35.27	43.51	16.6	56.86	46.08	16.7	47.34	54.38
17.4	48.79	51.19	17.4	7.53	51.12	17.5	34.83	43.88	17.5	56.89	46.47	17.7	47.68	54.65
18.4	48.65	51.43	18.4	7.28	51.43	18.5	34.32	44.24	18.5	56.91	46.86	18.7	48.02	54.93
19.4	48.50	51.65	19.4	7.01	51.73	19.5	33.74	44.60	19.5	56.93	47.26	19.7	48.34	55.23
20.4	48.35	51.85	20.4	6.73	52.01	20.5	33.08	44.94	20.5	56.93	47.65	20.6	48.62	55.54
21.4	48.21	52.03	21.4	6.44	52.26	21.5	32.37	45.25	21.5	56.92	48.03	21.6	48.88	55.84
22.4	48.07	52.19	22.4	6.15	52.49	22.5	31.66	45.53	22.5	56.91	48.38	22.6	49.11	56.13
23.4	47.93	52.33	23.4	5.88	52.72	23.5	30.98	45.81	23.5	56.90	48.71	23.6	49.32	56.41
24.4	47.80	52.47	24.4	5.62	52.93	24.5	30.34	46.08	24.5	56.90	49.03	24.6	49.54	56.67
25.4	47.67	52.63	25.4	5.39	53.15	25.5	29.76	46.35	25.5	56.90	49.36	25.6	49.77	56.92
26.4	47.54	52.81	26.4	5.16	53.39	26.5	29.25	46.63	26.5	56.91	49.69	26.6	50.03	57.17
27.4	47.42	53.00	27.4	4.93	53.65	27.4	28.76	46.94	27.5	56.93	50.03	27.6	50.31	57.43
28.4	47.29	53.21	28.4	4.69	53.93	28.4	28.23	47.27	28.5	56.95	50.39	28.6	50.61	57.70
29.4	47.15	53.43	29.4	4.42	54.22	29.4	27.64	47.62	29.5	56.96	50.79	29.6	50.92	57.99
30.3	47.00	53.64	30.4	4.12	54.51	30.4	26.96	47.98	30.5	56.97	51.21	30.6	51.23	58.32
31.3	46.83	53.84	31.4	3.79	54.80	31.4	26.17	48.33	31.5	56.96	51.63	31.6	51.52	58.67
32.3	46.65	54.02	32.4	3.45	55.06	32.4	25.29	48.67	32.5	56.94	52.04	32.6	51.78	59.02
	7.35	+7.28		16.93	+16.90		57.99	+57.98		7.38	+7.31		18.09	+18.07
	$16^{h}\ 54^{m}$	$44^{s}.256$		$17^{h}\ 59^{m}$	$59^{s}.80$		$19^{h}\ 6^{m}$	$14^{s}.74$		$20^{h}\ 48^{m}$	$52^{s}.975$		$23^{h}\ 27^{m}$	$44^{s}.908$
	+82° 10′	49″.69		+86° 36′	51″.16		+89° 0′	45″.46		+82° 12′	49″.40		+86° 49′	59″.29

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	16 54	+82 10	Aug.	17 59	+86 36	Aug.	19 5	+89 0	Aug.	20 48	+82 12	Aug.	23 27	+86 49
	s	″		s	″		s	″		s	″		s	″
1.3	46.65	54.02	1.4	63.45	55.06	1.4	85.29	48.67	1.5	56.94	52.04	1.6	51.78	59.02
2.3	46.47	54.16	2.4	63.08	55.30	2.4	84.33	48.99	2.5	56.90	52.44	2.6	52.00	59.38
3.3	46.30	54.28	3.4	62.72	55.51	3.4	83.35	49.29	3.5	56.86	52.82	3.6	52.19	59.74
4.3	46.13	54.37	4.4	62.37	55.70	4.4	82.40	49.56	4.5	56.82	53.18	4.6	52.36	60.08
5.3	45.97	54.46	5.4	62.04	55.88	5.4	81.49	49.81	5.5	56.78	53.52	5.6	52.52	60.40
6.3	45.82	54.55	6.4	61.73	56.05	6.4	80.64	50.05	6.5	56.74	53.84	6.6	52.68	60.71
7.3	45.68	54.66	7.4	61.44	56.23	7.4	79.83	50.29	7.5	56.71	54.16	7.6	52.86	61.00
8.3	45.54	54.78	8.4	61.15	56.43	8.4	79.06	50.54	8.5	56.69	54.49	8.6	53.06	61.29
9.3	45.40	54.91	9.4	60.86	56.63	9.4	78.32	50.81	9.5	56.68	54.83	9.6	53.28	61.59
10.3	45.25	55.06	10.4	60.57	56.85	10.4	77.57	51.10	10.5	56.66	55.18	10.6	53.50	61.89
11.3	45.10	55.21	11.4	60.26	57.08	11.4	76.78	51.41	11.5	56.64	55.55	11.6	53.73	62.21
12.3	44.94	55.35	12.4	59.93	57.32	12.4	75.94	51.72	12.5	56.61	55.93	12.6	53.95	62.54
13.3	44.77	55.49	13.4	59.58	57.55	13.4	75.02	52.02	13.5	56.57	56.32	13.6	54.18	62.89
14.3	44.60	55.63	14.4	59.21	57.78	14.4	74.02	52.33	14.5	56.53	56.71	14.6	54.40	63.26
15.3	44.41	55.74	15.4	58.82	57.98	15.4	72.94	52.63	15.5	56.48	57.11	15.6	54.59	63.64
16.3	44.22	55.82	16.3	58.42	58.17	16.4	71.80	52.91	16.5	56.42	57.49	16.6	54.75	64.04
17.3	44.04	55.88	17.3	58.02	58.34	17.4	70.62	53.17	17.5	56.34	57.87	17.6	54.88	64.44
18.3	43.85	55.92	18.3	57.61	58.48	18.4	69.41	53.40	18.5	56.26	58.23	18.6	54.99	64.82
19.3	43.67	55.95	19.3	57.22	58.61	19.4	68.22	53.62	19.5	56.18	58.56	19.6	55.08	65.19
20.3	43.50	55.97	20.3	56.84	58.73	20.4	67.08	53.83	20.5	56.10	58.88	20.6	55.16	65.55
21.3	43.34	55.99	21.3	56.48	58.84	21.4	66.00	54.03	21.5	56.03	59.19	21.6	55.25	65.89
22.3	43.18	56.03	22.3	56.13	58.97	22.4	64.98	54.24	22.4	55.96	59.50	22.6	55.35	66.21
23.3	43.03	56.09	23.3	55.79	59.12	23.4	64.00	54.47	23.4	55.91	59.82	23.6	55.48	66.54
24.3	42.87	56.17	24.3	55.45	59.29	24.4	63.04	54.71	24.4	55.86	60.16	24.6	55.64	66.88
25.3	42.70	56.26	25.3	55.09	59.47	25.4	62.03	54.98	25.4	55.80	60.53	25.6	55.82	67.23
26.3	42.52	56.35	26.3	54.70	59.66	26.4	60.92	55.26	26.4	55.74	60.91	26.5	55.99	67.61
27.3	42.33	56.42	27.3	54.28	59.84	27.4	59.71	55.54	27.4	55.67	61.30	27.5	56.14	68.02
28.3	42.13	56.47	28.3	53.84	60.00	28.4	58.42	55.81	28.4	55.59	61.69	28.5	56.27	68.45
29.3	41.92	56.50	29.3	53.39	60.14	29.4	57.05	56.06	29.4	55.49	62.07	29.5	56.36	68.88
30.3	41.72	56.49	30.3	52.93	60.25	30.4	55.65	56.28	30.4	55.38	62.43	30.5	56.43	69.30
31.3	41.53	56.46	31.3	52.48	60.34	31.4	54.25	56.47	31.4	55.26	62.75	31.5	56.46	69.71
32.3	41.34	56.42	32.3	52.05	60.41	32.4	52.90	56.64	32.4	55.15	63.05	32.5	56.47	70.10
	7.35	+7.28		16.94	+16.91		58.15	+58.14		7.38	+7.32		18.11	+18.08
	$16^h\ 54^m$	$44^s.256$		$17^h\ 59^m$	$59^s.80$		$19^h\ 6^m$	$14^s.74$		$20^h\ 48^m$	$52^s.975$		$23^h\ 27^m$	$44^s.908$
	$+82^\circ\ 10'$	$49''.69$		$+86^\circ\ 36'$	$51''.16$		$+89^\circ\ 0'$	$45''.46$		$+82^\circ\ 12'$	$49''.40$		$+86^\circ\ 49'$	$59''.29$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**89 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	16 54	+82 10	Sept.	17 59	+86 37	Sept.	19 5	+89 0	Sept.	20 48	+82 13	Sept.	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
1.3	41.34	56.42	1.3	52.05	0.41	1.4	52.90	56.64	1.4	55.15	3.05	1.5	56.47	10.10
2.3	41.17	56.38	2.3	51.64	0.47	2.3	51.63	56.79	2.4	55.05	3.34	2.5	56.48	10.47
3.3	41.00	56.35	3.3	51.26	0.53	3.3	50.41	56.95	3.4	54.96	3.62	3.5	56.50	10.83
4.3	40.84	56.33	4.3	50.89	0.61	4.3	49.24	57.11	4.4	54.87	3.90	4.5	56.54	11.17
5.2	40.67	56.32	5.3	50.52	0.69	5.3	48.10	57.29	5.4	54.78	4.19	5.5	56.60	11.51
6.2	40.51	56.31	6.3	50.14	0.78	6.3	46.96	57.48	6.4	54.70	4.49	6.5	56.67	11.85
7.2	40.35	56.33	7.3	49.76	0.89	7.3	45.79	57.68	7.4	54.61	4.81	7.5	56.74	12.21
8.2	40.17	56.35	8.3	49.36	1.01	8.3	44.58	57.89	8.4	54.52	5.14	8.5	56.82	12.59
9.2	39.99	56.36	9.3	48.95	1.12	9.3	43.32	58.10	9.4	54.43	5.47	9.5	56.90	12.98
10.2	39.80	56.36	10.3	48.52	1.23	10.3	41.99	58.30	10.4	54.33	5.81	10.5	56.97	13.38
11.2	39.60	56.34	11.3	48.07	1.33	11.3	40.59	58.51	11.4	54.22	6.16	11.5	57.01	13.79
12.2	39.41	56.29	12.3	47.60	1.40	12.3	39.14	58.71	12.4	54.10	6.50	12.5	57.03	14.21
13.2	39.21	56.22	13.3	47.13	1.45	13.3	37.63	58.88	13.4	53.96	6.82	13.5	57.02	14.64
14.2	39.02	56.13	14.3	46.66	1.48	14.3	36.09	59.02	14.4	53.82	7.12	14.5	56.99	15.06
15.2	38.83	56.03	15.3	46.20	1.48	15.3	34.56	59.14	15.4	53.68	7.40	15.5	56.93	15.47
16.2	38.65	55.91	16.3	45.76	1.47	16.3	33.09	59.25	16.4	53.54	7.66	16.5	56.86	15.86
17.2	38.48	55.79	17.3	45.34	1.46	17.3	31.67	59.34	17.4	53.41	7.91	17.5	56.79	16.23
18.2	38.31	55.69	18.3	44.94	1.45	18.3	30.32	59.43	18.4	53.29	8.15	18.5	56.74	16.58
19.2	38.15	55.60	19.3	44.55	1.46	19.3	29.03	59.54	19.4	53.17	8.39	19.5	56.70	16.93
20.2	37.99	55.54	20.3	44.16	1.49	20.3	27.77	59.67	20.4	53.06	8.65	20.5	56.68	17.28
21.2	37.82	55.49	21.2	43.76	1.54	21.3	26.47	59.82	21.4	52.95	8.93	21.5	56.69	17.65
22.2	37.64	55.44	22.2	43.34	1.60	22.3	25.11	59.98	22.4	52.84	9.23	22.5	56.71	18.04
23.2	37.45	55.38	23.2	42.89	1.66	23.3	23.67	60.14	23.4	52.72	9.54	23.5	56.72	18.46
24.2	37.25	55.30	24.2	42.42	1.71	24.3	22.14	60.30	24.4	52.58	9.86	24.5	56.70	18.89
25.2	37.05	55.20	25.2	41.93	1.73	25.3	20.53	60.45	25.4	52.43	10.17	25.5	56.65	19.32
26.2	36.85	55.07	26.2	41.44	1.72	26.3	18.88	60.56	26.4	52.27	10.45	26.5	56.56	19.76
27.2	36.66	54.91	27.2	40.95	1.68	27.3	17.23	60.65	27.4	52.11	10.70	27.5	56.44	20.18
28.2	36.48	54.73	28.2	40.49	1.62	28.3	15.63	60.71	28.3	51.95	10.93	28.5	56.30	20.57
29.2	36.30	54.55	29.2	40.05	1.54	29.3	14.09	60.75	29.3	51.79	11.14	29.5	56.15	20.95
30.2	36.14	54.37	30.2	39.63	1.46	30.3	12.62	60.79	30.3	51.64	11.33	30.5	56.02	21.32
31.2	35.98	54.21	31.2	39.24	1.40	31.3	11.22	60.82	31.3	51.49	11.51	31.4	55.89	21.66
	7.35	+7.28		16.95	+16.92		58.26	+58.25		7.39	+7.32		18.13	+18.10
	16h 54m	44s.256		17h 59m	59s.80		19h 6m	14s.74		20h 48m	52s.975		23h 27m	44s.908
	+82° 10′	49″.69		+86° 36′	51″.16		+89° 0′	45″.46		+82° 12′	49″.40		+86° 49′	59″.29

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Dec nati *Nor*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Oct.	16 54	+82 10	Oct.	17 59	+86 36	Oct.	19 4	+89 1	Oct.	20 48	+82 13	Oct.	23 27	+86
	s	″		s	″		s	″		s	″		s	″
1.2	35.98	54.21	1.2	39.24	61.40	1.3	71.22	0.82	1.3	51.49	11.51	1.4	55.89	21.
2.2	35.83	54.06	2.2	38.85	61.35	2.3	69.86	0.87	2.3	51.35	11.71	2.4	55.77	21.
3.2	35.68	53.92	3.2	38.46	61.31	3.3	68.53	0.94	3.3	51.22	11.91	3.4	55.67	22.
4.2	35.53	53.80	4.2	38.07	61.28	4.3	67.19	1.01	4.3	51.08	12.12	4.4	55.59	22.
5.2	35.38	53.67	5.2	37.67	61.26	5.3	65.83	1.10	5.3	50.95	12.34	5.4	55.52	23.
6.2	35.21	53.55	6.2	37.25	61.24	6.3	64.42	1.18	6.3	50.81	12.57	6.4	55.44	23.
7.2	35.04	53.42	7.2	36.82	61.21	7.3	62.95	1.27	7.3	50.66	12.81	7.4	55.35	23.
8.2	34.87	53.27	8.2	36.38	61.17	8.2	61.42	1.35	8.3	50.51	13.05	8.4	55.24	24.
9.2	34.69	53.10	9.2	35.92	61.12	9.2	59.83	1.41	9.3	50.35	13.28	9.4	55.11	24.
10.2	34.51	52.91	10.2	35.45	61.05	10.2	58.20	1.45	10.3	50.19	13.50	10.4	54.95	24.
11.2	34.33	52.70	11.2	34.99	60.96	11.2	56.55	1.47	11.3	50.01	13.70	11.4	54.77	25.
12.1	34.16	52.47	12.2	34.53	60.84	12.2	54.90	1.47	12.3	49.82	13.88	12.4	54.56	25.
13.1	34.00	52.22	13.2	34.09	60.70	13.2	53.29	1.46	13.3	49.64	14.04	13.4	54.33	26.
14.1	33.84	51.98	14.2	33.68	60.55	14.2	51.75	1.43	14.3	49.47	14.18	14.4	54.11	26.
15.1	33.70	51.73	15.2	33.29	60.41	15.2	50.29	1.39	15.3	49.30	14.30	15.4	53.89	26.7
16.1	33.57	51.50	16.2	32.91	60.28	16.2	48.87	1.35	16.3	49.14	14.42	16.4	53.69	27.
17.1	33.44	51.29	17.2	32.54	60.16	17.2	47.50	1.34	17.3	49.00	14.56	17.4	53.52	27.
18.1	33.30	51.11	18.2	32.17	60.06	18.2	46.15	1.35	18.3	48.85	14.72	18.4	53.36	27.
19.1	33.15	50.94	19.2	31.78	59.97	19.2	44.77	1.37	19.3	48.71	14.89	19.4	53.22	28.0
20.1	33.00	50.76	20.2	31.37	59.90	20.2	43.31	1.41	20.3	48.55	15.08	20.4	53.08	28.4
21.1	32.84	50.57	21.2	30.93	59.82	21.2	41.75	1.44	21.3	48.39	15.27	21.4	52.92	28.7
22.1	32.67	50.35	22.2	30.48	59.72	22.2	40.13	1.45	22.3	48.22	15.45	22.4	52.73	29.1
23.1	32.50	50.10	23.2	30.02	59.58	23.2	38.47	1.44	23.3	48.03	15.62	23.4	52.51	29.5
24.1	32.34	49.82	24.2	29.57	59.42	24.2	36.80	1.41	24.3	47.84	15.77	24.4	52.25	29.9
25.1	32.19	49.53	25.2	29.14	59.23	25.2	35.16	1.34	25.3	47.64	15.89	25.4	51.97	30.3
26.1	32.05	49.23	26.2	28.73	59.02	26.2	33.58	1.25	26.3	47.45	15.97	26.4	51.67	30.6
27.1	31.93	48.93	27.2	28.35	58.81	27.2	32.09	1.14	27.3	47.27	16.03	27.4	51.38	30.9
28.1	31.81	48.64	28.1	28.00	58.61	28.2	30.68	1.03	28.3	47.10	16.08	28.4	51.10	31.2
29.1	31.70	48.36	29.1	27.67	58.42	29.2	29.34	0.94	29.3	46.93	16.14	29.4	50.84	31.47
30.1	31.58	48.10	30.1	27.33	58.24	30.2	28.05	0.86	30.3	46.78	16.20	30.4	50.59	31.74
31.1	31.46	47.86	31.1	27.00	58.07	31.2	26.77	0.78	31.3	46.62	16.28	31.4	50.36	32.01
32.1	31.35	47.61	32.1	26.67	57.92	32.2	25.48	0.72	32.3	46.47	16.37	32.4	50.14	32.29
	7.35	+7.28		16.95	+16.92		58.29	+58.28		7.39	+7.32		18.15	+18.12
	16^{h} 54^{m}	44^{s}.256		17^{h} 59^{m}	59^{s}.80		19^{h} 6^{m}	14^{s}.74		20^{h} 48^{m}	52^{s}.975		23^{h} 27^{m}	44^{s}.908
	+82° 10′	49″.69		+86° 36′	51″.16		+89° 0′	45″.46		+82° 12′	49″.40		+86° 49′	59″.29

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	16 54	+82 10	Nov.	17 59	+86 36	Nov.	19 3	+89 0	Nov.	20 48	+82 13	Nov.	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
1.1	31.35	47.61	1.1	26.67	57.92	1.2	85.48	60.72	1.3	46.47	16.37	1.4	50.14	32.29
2.1	31.25	47.37	2.1	26.32	57.77	2.2	84.16	60.67	2.3	46.31	16.46	2.4	49.92	32.58
3.1	31.13	47.13	3.1	25.96	57.62	3.2	82.79	60.62	3.2	46.14	16.55	3.4	49.70	32.88
4.1	31.00	46.88	4.1	25.59	57.46	4.2	81.37	60.56	4.2	45.98	16.64	4.4	49.46	33.19
5.1	30.87	46.61	5.1	25.21	57.28	5.2	79.90	60.49	5.2	45.81	16.74	5.4	49.20	33.50
6.1	30.74	46.32	6.1	24.82	57.08	6.2	78.40	60.40	6.2	45.63	16.82	6.4	48.92	33.82
7.1	30.61	46.01	7.1	24.44	56.86	7.2	76.88	60.29	7.2	45.44	16.89	7.3	48.61	34.13
8.1	30.49	45.67	8.1	24.06	56.62	8.2	75.36	60.16	8.2	45.24	16.93	8.3	48.27	34.43
9.1	30.38	45.33	9.1	23.70	56.36	9.2	73.87	60.01	9.2	45.05	16.94	9.3	47.91	34.71
10.1	30.28	44.98	10.1	23.36	56.10	10.2	72.44	59.84	10.2	44.86	16.94	10.3	47.55	34.97
11.1	30.19	44.63	11.1	23.05	55.82	11.2	71.10	59.66	11.2	44.68	16.92	11.3	47.20	35.20
12.1	30.11	44.30	12.1	22.76	55.55	12.2	69.84	59.48	12.2	44.51	16.89	12.3	46.86	35.41
13.1	30.03	43.98	13.1	22.48	55.30	13.1	68.63	59.32	13.2	44.36	16.87	13.3	46.54	35.62
14.1	29.96	43.69	14.1	22.21	55.08	14.1	67.47	59.17	14.2	44.20	16.87	14.3	46.25	35.83
15.1	29.88	43.41	15.1	21.93	54.88	15.1	66.30	59.05	15.2	44.05	16.88	15.3	45.98	36.05
16.1	29.79	43.14	16.1	21.63	54.68	16.1	65.07	58.94	16.2	43.90	16.91	16.3	45.72	36.30
17.0	29.69	42.86	17.1	21.31	54.48	17.1	63.76	58.84	17.2	43.73	16.95	17.3	45.45	36.56
18.0	29.58	42.56	18.1	20.97	54.26	18.1	62.39	58.72	18.2	43.56	16.98	18.3	45.16	36.83
19.0	29.48	42.23	19.1	20.62	54.02	19.1	60.97	58.58	19.2	43.38	17.00	19.3	44.83	37.11
20.0	29.38	41.87	20.1	20.27	53.75	20.1	59.52	58.42	20.2	43.19	17.00	20.3	44.46	37.38
21.0	29.28	41.50	21.1	19.94	53.45	21.1	58.10	58.22	21.2	42.99	16.98	21.3	44.06	37.63
22.0	29.20	41.12	22.1	19.64	53.14	22.1	56.76	58.00	22.2	42.80	16.92	22.3	43.65	37.85
23.0	29.13	40.73	23.1	19.37	52.82	23.1	55.51	57.76	23.2	42.61	16.83	23.3	43.24	38.05
24.0	29.08	40.35	24.1	19.13	52.50	24.1	54.35	57.53	24.2	42.44	16.74	24.3	42.85	38.22
25.0	29.04	39.99	25.1	18.91	52.19	25.1	53.27	57.29	25.2	42.28	16.64	25.3	42.48	38.36
26.0	29.00	39.65	26.1	18.70	51.90	26.1	52.26	57.06	26.2	42.13	16.54	26.3	42.12	38.49
27.0	28.96	39.32	27.1	18.50	51.62	27.1	51.29	56.85	27.2	41.99	16.45	27.3	41.78	38.63
28.0	28.92	39.01	28.1	18.31	51.36	28.1	50.32	56.66	28.2	41.85	16.37	28.3	41.45	38.78
29.0	28.88	38.70	29.1	18.10	51.10	29.1	49.34	56.47	29.2	41.70	16.30	29.3	41.13	38.93
30.0	28.83	38.39	30.1	17.88	50.85	30.1	48.33	56.28	30.2	41.55	16.24	30.3	40.81	39.09
31.0	28.77	38.07	31.1	17.66	50.59	31.1	47.28	56.10	31.2	41.40	16.18	31.3	40.48	39.25
	7.35	+7.28		16.94	+16.91		58.25	+58.24		7.39	+7.32		18.16	+18.13
	$16^h\ 54^m$	$44^s.256$		$17^h\ 59^m$	$59^s.80$		$19^h\ 6^m$	$14^s.74$		$20^h\ 48^m$	$52^s.975$		$23^h\ 27^m$	$44^s.908$
	$+82^\circ\ 10'$	$49''.69$		$+86^\circ\ 36'$	$51''.16$		$+89^\circ\ 0'$	$45''.46$		$+82^\circ\ 12'$	$49''.40$		$+86^\circ\ 49'$	$59''.29$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			δ Ursæ Minoris. Mag. 4.4			λ Ursæ Minoris. Mag. 6.6			76 Draconis. Mag. 5.7			39 H. Cephei. Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North*
	h m	° '		h m	° '		h m	° '		h m	° '		h m	°
Dec.	16 54	+82 10	Dec.	17 59	+86 36	Dec.	19 3	+89 0	Dec.	20 48	+82 13	Dec.	23 27	+86 5
	s	''		s	''		s	''		s	''		s	''
1.0	28.77	38.07	1.1	17.66	50.59	1.1	47.28	56.10	1.2	41.40	16.18	1.3	40.48	39.2
2.0	28.72	37.74	2.1	17.43	50.32	2.1	46.19	55.90	2.2	41.25	16.12	2.3	40.14	39.4
3.0	28.67	37.39	3.1	17.18	50.04	3.1	45.06	55.69	3.2	41.09	16.05	3.3	39.78	39.6
4.0	28.61	37.03	4.0	16.94	49.73	4.1	43.92	55.46	4.2	40.92	15.96	4.3	39.39	39.7
4.9	28.57	36.65	5.0	16.70	49.41	5.1	42.78	55.22	5.2	40.75	15.85	5.3	38.98	39.9
5.9	28.53	36.26	6.0	16.49	49.06	6.1	41.67	54.95	6.2	40.57	15.71	6.3	38.55	40.0
6.9	28.50	35.85	7.0	16.30	48.70	7.1	40.63	54.66	7.2	40.40	15.55	7.3	38.11	40.2
7.9	28.49	35.45	8.0	16.13	48.33	8.1	39.68	54.36	8.2	40.24	15.38	8.3	37.67	40.2
8.9	28.49	35.07	9.0	15.99	47.98	9.1	38.83	54.06	9.2	40.09	15.20	9.3	37.24	40.3
9.9	28.49	34.71	10.0	15.87	47.64	10.1	38.06	53.77	10.1	39.95	15.02	10.3	36.84	40.4
10.9	28.49	34.36	11.0	15.76	47.32	11.1	37.34	53.50	11.1	39.82	14.84	11.3	36.47	40.4
11.9	28.49	34.04	12.0	15.65	47.02	12.1	36.64	53.25	12.1	39.69	14.68	12.3	36.13	40.5
12.9	28.48	33.73	13.0	15.53	46.74	13.1	35.90	53.02	13.1	39.57	14.55	13.3	35.80	40.6
13.9	28.47	33.42	14.0	15.39	46.47	14.1	35.11	52.80	14.1	39.45	14.43	14.2	35.46	40.7
14.9	28.45	33.10	15.0	15.22	46.19	15.1	34.24	52.58	15.1	39.31	14.31	15.2	35.11	40.8
15.9	28.42	32.75	16.0	15.05	45.89	16.1	33.32	52.34	16.1	39.16	14.19	16.2	34.74	40.9
16.9	28.40	32.38	17.0	14.88	45.56	17.1	32.38	52.08	17.1	39.00	14.05	17.2	34.34	41.0
17.9	28.39	31.99	18.0	14.72	45.21	18.1	31.45	51.79	18.1	38.85	13.88	18.2	33.90	41.1
18.9	28.38	31.59	19.0	14.58	44.84	19.1	30.59	51.47	19.1	38.69	13.68	19.2	33.45	41.2
19.9	28.39	31.18	20.0	14.47	44.45	20.0	29.81	51.14	20.1	38.54	13.45	20.2	33.00	41.27
20.9	28.42	30.78	21.0	14.39	44.07	21.0	29.13	50.80	21.1	38.41	13.21	21.2	32.55	41.28
21.9	28.46	30.41	21.9	14.34	43.70	22.0	28.56	50.46	22.1	38.28	12.96	22.2	32.12	41.27
22.9	28.50	30.05	22.9	14.32	43.35	23.0	28.07	50.13	23.1	38.17	12.71	23.2	31.72	41.24
23.9	28.54	29.70	23.9	14.31	43.02	24.0	27.64	49.81	24.1	38.07	12.46	24.2	31.34	41.21
24.9	28.59	29.38	24.9	14.30	42.70	25.0	27.23	49.52	25.1	37.97	12.23	25.2	30.98	41.19
25.9	28.63	29.07	25.9	14.28	42.39	26.0	26.83	49.25	26.1	37.87	12.01	26.2	30.63	41.16
26.9	28.67	28.76	26.9	14.25	42.09	27.0	26.40	48.97	27.1	37.77	11.81	27.2	30.29	41.15
27.9	28.71	28.46	27.9	14.22	41.79	28.0	25.93	48.70	28.1	37.68	11.61	28.2	29.95	41.14
28.9	28.74	28.15	28.9	14.18	41.49	29.0	25.44	48.42	29.1	37.57	11.40	29.2	29.60	41.14
29.9	28.77	27.81	29.9	14.12	41.17	30.0	24.92	48.14	30.1	37.46	11.19	30.2	29.23	41.14
30.9	28.80	27.46	30.9	14.07	40.84	31.0	24.38	47.84	31.1	37.34	10.97	31.2	28.83	41.14
31.9	28.83	27.10	31.9	14.03	40.49	32.0	23.85	47.52	32.1	37.22	10.73	32.2	28.42	41.13
	7.35	+7.28		16.93	+16.90		58.15	+58.14		7.39	+7.32		18.17	+18.14
	$16^h\ 54^m$	$44^s.256$		$17^h\ 59^m$	$59^s.80$		$19^h\ 6^m$	$14^s.74$		$20^h\ 48^m$	$52^s.975$		$23^h\ 27^m$	$44^s.908$
	+82° 10'	49''.69		+86° 36'	51''.16		+89° 0'	45''.46		+82° 12'	49''.40		+86° 49'	59''.29

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Piscium. Mag. 4.7				α Andromedæ. Mag. 2.2				β Cassiopeiæ. Mag. 2.4				ε Phœnicis. Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 0 0		° ′ − 6 10		h m 0 3		° ′ +28 36		h m 0 4		° ′ +58 40		h m 0 5		° ′ −46 12	
	s		″		s		″		s		″		s		″	
Jan. 0.2	56.13	10	81.2	5	56.07	13	66.5	9	33.83	30	50.0	8	3.49	19	93.2	5
10.2	56.03	9	81.7	4	55.94	13	65.6	11	33.53	29	49.2	12	3.30	17	92.7	9
20.2	55.94	8	82.1	3	55.81	11	64.5	13	33.24	26	48.0	16	3.13	16	91.8	13
30.1	55.86	6	82.4	1	55.70	9	63.2	15	32.98	23	46.4	20	2.97	12	90.5	17
Feb. 9.1	55.80	4	82.5	1	55.61	7	61.7	16	32.75	18	44.4	24	2.85	9	88.8	21
19.1	55.76	2	82.4	2	55.54	3	60.1	16	32.57	12	42.0	26	2.76	6	86.7	24
Mar. 1.1	55.74	2	82.2	5	55.51	0	58.5	15	32.45	5	39.4	27	2.70	1	84.3	27
11.0	55.76	5	81.7	7	55.51	4	57.0	13	32.40	3	36.7	26	2.69	4	81.6	29
21.0	55.81	8	81.0	10	55.55	9	55.7	11	32.43	10	34.1	25	2.73	8	78.7	30
31.0	55.89	13	80.0	12	55.64	13	54.6	9	32.53	19	31.6	23	2.81	13	75.7	32
Apr. 10.0	56.02	16	78.8	14	55.77	18	53.7	5	32.72	26	29.3	19	2.94	19	72.5	32
19.9	56.18	20	77.4	16	55.95	23	53.2	2	32.98	33	27.4	15	3.13	24	69.3	31
29.9	56.38	24	75.8	18	56.18	26	53.0	2	33.31	39	25.9	11	3.37	28	66.2	31
May 9.9	56.62	27	74.0	20	56.44	30	53.2	6	33.70	45	24.8	6	3.65	32	63.1	29
19.8	56.89	29	72.0	21	56.74	33	53.8	10	34.15	48	24.2	0	3.97	36	60.2	27
29.8	57.18	31	69.9	21	57.07	34	54.8	14	34.63	51	24.2	5	4.33	39	57.5	24
June 8.8	57.49	32	67.8	21	57.41	35	56.2	17	35.14	52	24.7	10	4.72	41	55.1	20
18.8	57.81	33	65.7	21	57.76	36	57.9	20	35.66	52	25.7	15	5.13	42	53.1	17
28.7	58.14	32	63.6	20	58.12	34	59.9	22	36.18	51	27.2	20	5.55	41	51.4	12
July 8.7	58.46	30	61.6	19	58.46	33	62.1	24	36.69	48	29.2	24	5.96	40	50.2	7
18.7	58.76	29	59.7	17	58.79	31	64.5	25	37.17	44	31.6	27	6.36	37	49.5	3
28.7	59.05	26	58.0	14	59.10	27	67.0	25	37.61	40	34.3	30	6.73	34	49.2	2
Aug. 7.6	59.31	22	56.6	11	59.37	24	69.5	26	38.01	34	37.3	32	7.07	30	49.4	7
17.6	59.53	19	55.5	9	59.61	21	72.1	25	38.35	28	40.5	34	7.37	25	50.1	11
27.6	59.72	15	54.6	6	59.82	16	74.6	25	38.63	22	43.9	34	7.62	19	51.2	15
Sept. 6.5	59.87	11	54.0	4	59.98	12	77.1	23	38.85	16	47.3	35	7.81	14	52.7	18
16.5	59.98	7	53.6	1	60.10	8	79.4	21	39.01	9	50.8	34	7.95	8	54.5	20
26.5	60.05	4	53.5	1	60.18	4	81.5	19	39.10	3	54.2	33	8.03	2	56.5	23
Oct. 6.5	60.09	1	53.6	4	60.22	0	83.4	17	39.13	3	57.5	31	8.05	3	58.8	23
16.4	60.10	3	54.0	5	60.22	2	85.1	15	39.10	8	60.6	29	8.02	7	61.1	22
26.4	60.07	5	54.5	5	60.20	6	86.6	11	39.02	14	63.5	25	7.95	12	63.3	21
Nov. 5.4	60.02	7	55.0	7	60.14	8	87.7	9	38.88	18	66.0	22	7.83	15	65.4	19
15.4	59.95	8	55.7	7	60.06	9	88.6	5	38.70	22	68.2	17	7.68	18	67.3	16
25.3	59.87	9	56.4	8	59.97	11	89.1	2	38.48	25	69.9	12	7.50	19	68.9	12
Dec. 5.3	59.78	10	57.2	7	59.86	12	89.3	1	38.23	28	71.1	7	7.31	20	70.1	8
15.3	59.68	11	57.9	7	59.74	13	89.2	3	37.95	30	71.8	2	7.11	20	70.9	3
25.2	59.57	10	58.6	5	59.61	13	88.9	7	37.65	30	72.0	3	6.91	20	71.2	1
35.2	59.47		59.1		59.48		88.2		37.35		71.7		6.71		71.1	
Sec δ, Tan δ	1.006		−0.108		1.139		+0.546		1.924		+1.643		1.445		−1.044	
Mean Place	$56^s.041$		79″.17		$56^s.354$		56″.35		$34^s.872$		31″.69		$2^s.935$		79″.26	
$D'_\psi\alpha$, $D_\omega\alpha$	0.00		+0.01		0.00		−0.04		0.00		−0.11		0.00		+0.07	
$D_\psi\delta$, $D_\omega\delta$	+0.4		0.0		+0.4		0.0		+0.4		0.0		+0.4		0.0	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	22 Andromedæ. Mag. 5.1				γ Pegasi. Mag. 2.9				σ Andromedæ. Mag. 4.5				ι Ceti. Mag. 3.8		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m 0 5		° ′ +45 35		h m 0 8		° ′ +14 42		h m 0 13		° ′ +36 18		h m 0 15		° − 9
	s		″		s		″		s		″		s		″
Jan. 0.2	50.20		52.6		48.26		25.4		49.53		43.4		2.99		64.7
10.2	50.00	20	51.8	8	48.15	11	24.7	7	49.38	15	42.6	8	2.89	10	65.2
20.2	49.82	18	50.6	12	48.05	10	23.8	9	49.23	15	41.5	11	2.79	10	65.5
30.2	49.65	17	49.0	16	47.96	9	22.8	10	49.09	14	40.1	14	2.70	9	65.7
Feb. 9.1	49.50	15	47.1	19	47.88	8	21.8	10	48.97	12	38.5	16	2.63	7	65.7
19.1	49.39	11	45.0	21	47.83	5	20.9	9	48.88	9	36.7	18	2.57	6	65.4
Mar. 1.1	49.32	7	42.8	22	47.80	3	20.0	9	48.82	6	34.8	19	2.54	3	65.0
11.0	49.30	2	40.6	22	47.80	0	19.2	8	48.81	1	33.0	18	2.54	0	64.4
21.0	49.33	3	38.4	22	47.84	4	18.6	6	48.84	3	31.3	17	2.58	4	63.5
31.0	49.42	9	36.4	20	47.92	8	18.3	3	48.91	7	29.7	16	2.65	7	62.4
Apr. 10.0	49.57	15	34.7	17	48.04	12	18.3	0	49.04	13	28.4	13	2.76	11	61.0
19.9	49.78	21	33.3	14	48.20	16	18.5	2	49.22	18	27.5	9	2.91	15	59.4
29.9	50.05	27	32.3	10	48.40	20	19.0	5	49.45	23	26.9	6	3.10	19	57.6
May 9.9	50.36	31	31.8	5	48.65	25	19.9	9	49.72	27	26.7	2	3.32	22	55.7
19.8	50.71	35	31.7	1	48.92	27	21.1	12	50.03	31	26.9	2	3.58	26	53.6
29.8	51.09	38	32.1	4	49.22	30	22.5	14	50.38	35	27.6	7	3.87	29	51.4
June 8.8	51.50	41	33.0	9	49.54	32	24.2	17	50.74	36	28.7	11	4.18	31	49.2
18.8	51.91	41	34.3	13	49.87	33	26.1	19	51.12	38	30.1	14	4.50	32	47.1
28.7	52.33	42	36.0	17	50.20	33	28.2	21	51.49	37	31.9	18	4.82	32	45.0
July 8.7	52.73	40	38.2	22	50.53	33	30.4	22	51.86	37	34.0	21	5.15	33	43.0
18.7	53.12	39	40.6	24	50.84	31	32.6	22	52.21	35	36.4	24	5.46	31	41.2
28.7	53.47	35	43.2	26	51.13	29	34.8	22	52.54	33	39.0	26	5.75	29	39.6
Aug. 7.6	53.79	32	46.1	29	51.39	26	37.0	22	52.84	30	41.6	26	6.02	27	38.3
17.6	54.07	28	49.1	30	51.62	23	39.1	21	53.10	26	44.4	28	6.25	23	37.3
27.6	54.30	23	52.2	31	51.82	20	41.0	19	53.33	23	47.2	28	6.46	21	36.5
Sept. 6.5	54.49	19	55.3	31	51.98	16	42.7	17	53.51	18	49.9	27	6.62	16	36.0
16.5	54.62	13	58.4	31	52.10	12	44.3	16	53.64	13	52.5	26	6.74	12	35.9
26.5	54.71	9	61.3	29	52.18	8	45.7	14	53.74	10	55.1	26	6.83	9	36.0
Oct. 6.5	54.75	4	64.1	28	52.23	5	46.8	11	53.79	5	57.4	23	6.88	5	36.3
16.4	54.74	1	66.7	26	52.24	1	47.7	9	53.80	1	59.5	21	6.90	2	36.8
26.4	54.70	4	69.0	23	52.23	1	48.4	7	53.78	2	61.4	19	6.89	1	37.5
Nov. 5.4	54.62	8	71.0	20	52.19	4	48.8	4	53.73	5	63.0	16	6.85	4	38.3
15.4	54.50	12	72.6	16	52.13	6	49.0	2	53.65	8	64.2	12	6.79	6	39.1
25.3	54.36	14	73.9	13	52.05	8	49.0	0	53.54	11	65.1	9	6.71	8	40.0
Dec. 5.3	54.20	16	74.7	8	51.96	9	48.9	1	53.42	12	65.7	6	6.62	9	40.8
15.3	54.02	18	75.1	4	51.86	10	48.5	4	53.28	14	65.9	2	6.52	10	41.6
25.2	53.83	19	75.0	1	51.75	11	47.9	6	53.14	14	65.7	2	6.42	10	42.3
35.2	53.63	20	74.4	6	51.64	11	47.2	7	52.98	16	65.1	6	6.31	11	42.9
Sec δ, Tan δ	1.429		+1.021		1.034		+0.262		1.241		+0.735		1.013		−0.164
Mean Place	$50^{s}.789$		$37''.34$		$48^{s}.334$		$19''.79$		$49^{s}.868$		$30''.45$		$2^{s}.788$		$62''.09$
$D'_{\psi}a$, $D_{\omega}a$	0.00		−0.07		0.00		−0.02		0.00		−0.05		0.00		+0.01
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		0.0		+0.4		0.0		+0.4		+0.1		+0.4		+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**ζ Tucanæ.** Mag. 4.3				**44 Piscium.** Mag. 6.0				**β Hydri.** Mag. 2.9				**α Phœnicis.** Mag. 2.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 0 15		° ′ −65 22		h m 0 20		° ′ + 1 27		h m 0 21		° ′ −77 43		h m 0 22		° ′ −42 45	
	s		″		s		″		s		″		s		″	
an. 0.2	37.19		64.4		59.74		49.8		17.38		96.8		2.83		95.4	
10.2	36.80	39	63.6	8	59.64	10	49.2	6	16.49	89	95.7	11	2.65	18	95.2	2
20.2	36.43	37	62.2	14	59.55	9	48.6	6	15.65	84	94.1	16	2.48	17	94.6	6
30.2	36.10	33	60.2	20	59.46	9	48.0	6	14.89	76	91.8	23	2.33	15	93.6	10
eb. 9.1	35.83	27	57.8	24	59.38	8	47.6	4	14.24	65	89.1	27	2.20	13	92.1	15
19.1	35.60	23	55.0	28	59.32	6	47.3	3	13.71	53	86.0	31	2.09	11	90.3	18
ar. 1.1	35.45	15	51.8	32	59.29	3	47.1	2	13.30	41	82.6	34	2.02	7	88.1	22
11.0	35.36	9	48.4	34	59.28	1	47.1	0	13.04	26	79.0	36	1.99	3	85.7	24
21.0	35.35	1	44.8	36	59.31	3	47.3	2	12.94	10	75.1	39	2.00	1	83.0	27
31.0	35.42	7	41.1	37	59.37	6	47.8	5	12.98	4	71.2	39	2.06	6	80.1	29
pr. 10.0	35.58	16	37.3	38	59.48	11	48.5	7	13.18	20	67.3	39	2.16	10	77.0	31
19.9	35.81	23	33.6	37	59.63	15	49.5	10	13.54	36	63.5	38	2.32	16	73.9	31
29.9	36.12	31	30.1	35	59.81	18	50.7	12	14.05	51	59.9	36	2.53	21	70.8	31
ay 9.9	36.51	39	26.7	34	60.03	22	52.2	15	14.70	65	56.5	34	2.78	25	67.7	31
19.9	36.97	46	23.6	31	60.29	26	53.9	17	15.47	77	53.4	31	3.08	30	64.8	29
29.8	37.48	51	20.8	28	60.58	29	55.7	18	16.36	89	50.7	27	3.41	33	62.0	28
ne 8.8	38.04	56	18.4	24	60.88	30	57.7	20	17.34	98	48.5	22	3.77	36	59.4	26
18.8	38.63	59	16.5	19	61.20	32	59.8	21	18.38	104	46.7	18	4.16	39	57.2	22
28.7	39.25	62	15.0	15	61.52	32	61.9	21	19.46	108	45.5	12	4.55	39	55.4	18
ly 8.7	39.86	61	14.1	9	61.84	32	64.0	21	20.56	110	44.9	6	4.94	39	53.9	15
18.7	40.46	60	13.8	3	62.15	31	66.0	20	21.64	108	44.8	1	5.33	39	52.9	10
28.7	41.03	57	14.0	2	62.44	29	67.8	18	22.67	103	45.3	5	5.69	36	52.4	5
ug. 7.6	41.56	53	14.7	7	62.71	27	69.6	18	23.62	95	46.4	11	6.03	34	52.3	1
17.6	42.02	46	16.0	13	62.95	24	71.1	15	24.47	85	47.9	15	6.33	30	52.7	4
27.6	42.41	39	17.7	17	63.15	20	72.4	13	25.18	71	50.0	21	6.59	26	53.6	9
ept. 6.6	42.71	30	19.8	21	63.32	17	73.4	10	25.73	55	52.4	24	6.79	20	54.9	13
16.5	42.92	21	22.3	25	63.45	13	74.2	8	26.11	38	55.1	27	6.95	16	56.5	16
26.5	43.04	12	25.0	27	63.54	9	74.8	6	26.31	20	58.1	30	7.05	10	58.4	19
ct. 6.5	43.07	3	27.8	28	63.60	6	75.1	3	26.31	0	61.1	30	7.10	5	60.5	21
16.4	43.00	7	30.6	28	63.63	3	75.2	1	26.13	18	64.1	30	7.10	0	62.7	22
26.4	42.84	16	33.3	27	63.63	0	75.1	1	25.77	36	66.9	28	7.05	5	64.9	22
ov. 5.4	42.60	24	35.7	24	63.60	3	74.9	2	25.25	52	69.5	26	6.96	9	67.1	22
15.4	42.30	30	37.8	21	63.55	5	74.5	4	24.58	67	71.6	21	6.84	12	69.1	20
25.3	41.95	35	39.5	17	63.48	7	74.0	5	23.80	78	73.3	17	6.69	15	70.8	17
Dec. 5.3	41.57	38	40.7	12	63.40	8	73.4	6	22.94	86	74.5	12	6.53	16	72.1	13
15.3	41.16	41	41.4	7	63.31	9	72.8	6	22.03	91	75.0	5	6.35	18	73.1	10
25.3	40.74	42	41.5	1	63.21	10	72.2	6	21.10	93	75.0	0	6.16	19	73.7	6
35.2	40.34	40	41.0	5	63.10	11	71.5	7	20.17	93	74.2	8	5.98	18	73.8	1
ec δ, Tan δ	2.400		−2.181		1.000		+0.026		4.708		−4.600		1.362		−0.925	
ean Place	36s.041		47″.46		59s.613		48″.38		15s.025		78″.92		2s.200		82″.85	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		+0.15		0.00		0.00		−0.01		+0.31		0.00		+0.06	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.1		+0.4		+0.1		+0.4		+0.1		+0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**12 Ceti.** Mag. 6.0				**18 Ceti.** Mag. 5.2				**ζ Cassiopeiæ.** Mag. 3.7				**π Andromeda** Mag. 4.4		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Decl tion
	h m		° ′		h m		° ′		h m		° ′		h m		
	0 25		− 4 25		0 30		− 4 3		0 32		+53 25		0 32		+33
	s		″		s		″		s		″		s		″
Jan. 0.2	39.22	10	56.9	6	49.50	11	58.1	5	9.87	25	43.8	4	16.88	15	58.
10.2	39.12	10	57.5	5	49.39	10	58.6	5	9.62	25	43.4	9	16.73	14	58.
20.2	39.02	9	58.0	3	49.29	9	59.1	4	9.37	23	42.5	14	16.59	14	57.
30.2	38.93	8	58.3	2	49.20	8	59.5	2	9.14	21	41.1	17	16.45	12	55.8
Feb. 9.1	38.85	6	58.5	0	49.12	7	59.7	1	8.93	18	39.4	21	16.33	10	54.4
19.1	38.79	4	58.5	1	49.05	4	59.8	1	8.75	13	37.3	23	16.23	7	52.8
Mar. 1.1	38.75	1	58.4	4	49.01	2	59.7	4	8.62	8	35.0	24	16.16	3	51.2
11.1	38.74	2	58.0	6	48.99	2	59.3	6	8.54	1	32.6	24	16.13	1	49.6
21.0	38.76	6	57.4	8	49.01	6	58.7	8	8.53	5	30.2	23	16.14	5	48.0
31.0	38.82	10	56.6	11	49.07	9	57.9	10	8.58	13	27.9	21	16.19	11	46.6
Apr. 10.0	38.92	14	55.5	13	49.16	14	56.9	13	8.71	19	25.8	19	16.30	15	45.4
19.9	39.06	18	54.2	15	49.30	18	55.6	15	8.90	27	23.9	15	16.45	21	44.6
29.9	39.24	22	52.7	17	49.48	21	54.1	17	9.17	32	22.4	11	16.66	25	44.0
May 9.9	39.46	25	51.0	19	49.69	25	52.4	19	9.49	38	21.3	6	16.91	29	43.9
19.9	39.71	28	49.1	21	49.94	28	50.5	20	9.87	42	20.7	1	17.20	32	44.1
29.8	39.99	31	47.0	21	50.22	30	48.5	21	10.29	45	20.6	3	17.52	35	44.8
June 8.8	40.30	31	44.9	21	50.52	32	46.4	22	10.74	46	20.9	9	17.87	36	45.8
18.8	40.61	33	42.8	21	50.84	32	44.2	21	11.20	48	21.8	13	18.23	37	47.2
28.8	40.94	32	40.7	21	51.16	32	42.1	20	11.68	47	23.1	17	18.60	37	48.9
July 8.7	41.26	31	38.6	19	51.48	32	40.1	19	12.15	45	24.8	21	18.97	35	50.9
18.7	41.57	30	36.7	17	51.80	30	38.2	18	12.60	42	26.9	25	19.32	33	53.1
28.7	41.87	27	35.0	15	52.10	27	36.4	15	13.02	39	29.4	27	19.65	31	55.5
Aug. 7.6	42.14	24	33.5	13	52.37	25	34.9	13	13.41	35	32.1	30	19.96	28	58.0
17.6	42.38	21	32.2	10	52.62	21	33.6	10	13.76	30	35.1	31	20.24	23	60.6
27.6	42.59	17	31.2	8	52.83	18	32.6	8	14.06	25	38.2	32	20.47	20	63.2
Sept. 6.6	42.76	13	30.4	4	53.01	14	31.8	5	14.31	19	41.4	32	20.67	16	65.7
16.5	42.89	10	30.0	2	53.15	10	31.3	2	14.50	14	44.6	32	20.83	11	68.2
26.5	42.99	6	29.8	0	53.25	7	31.1	0	14.64	8	47.8	32	20.94	8	70.6
Oct. 6.5	43.05	3	29.8	3	53.32	4	31.1	2	14.72	3	51.0	29	21.02	4	72.7
16.5	43.08	0	30.1	4	53.36	0	31.3	5	14.75	1	53.9	28	21.06	0	74.7
26.4	43.08	2	30.5	6	53.36	2	31.8	5	14.74	7	56.7	24	21.06	2	76.4
Nov. 5.4	43.06	5	31.1	6	53.34	5	32.3	7	14.67	11	59.1	22	21.04	6	77.9
15.4	43.01	7	31.7	8	53.29	6	33.0	7	14.56	14	61.3	17	20.98	8	79.1
25.3	42.94	8	32.5	7	53.23	8	33.7	7	14.42	18	63.0	13	20.90	10	80.0
Dec. 5.3	42.86	10	33.2	7	53.15	9	34.4	8	14.24	21	64.3	9	20.80	12	80.6
15.3	42.76	10	33.9	7	53.06	10	35.2	7	14.03	23	65.2	4	20.68	13	80.8
25.3	42.66	10	34.6	6	52.96	10	35.9	6	13.80	25	65.6	1	20.55	15	80.7
35.2	42.56		35.2		52.86		36.5		13.55		65.5		20.40		80.2
Sec δ, Tan δ	1.003		−0.077		1.003		−0.071		1.678		+1.348		1.196		+0.656
Mean Place	$39^s.009$		$56''.41$		$49^s.254$		$57''.88$		$10^s.404$		$25''.55$		$17^s.026$		$45''.92$
$D'_\psi a$, $D_\omega a$	0.00		+0.01		0.00		0.00		0.00		−0.09		0.00		−0.04
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.1		+0.4		+0.1		+0.4		+0.1		+0.4		+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Andromedæ. Mag. 4.5				δ Andromedæ. Mag. 3.5				α Cassiopeiæ. Var. 2.2–2.8				μ Phœnicis. Mag. 4.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 33		+28 50		0 34		+30 23		0 35		+56 3		0 37		−46 32	
	s		″		s		″		s		″		s		″	
Jan. 0.2	60.38		53.2		43.45		37.3		36.54		76.1		16.58		99.3	
10.2	60.25	13	52.5	7	43.31	14	36.7	6	36.27	27	75.7	4	16.37	21	99.2	1
20.2	60.12	13	51.6	9	43.18	13	35.8	9	35.99	28	74.9	8	16.17	20	98.6	6
30.2	59.99	13	50.5	11	43.05	13	34.6	12	35.73	26	73.5	14	15.99	18	97.6	10
Feb. 9.1	59.88	11	49.2	13	42.93	12	33.3	13	35.50	23	71.8	17	15.82	17	96.1	15
19.1	59.78	10	47.7	15	42.84	9	31.8	15	35.30	20	69.7	21	15.68	14	94.2	19
Mar. 1.1	59.72	6	46.3	14	42.77	7	30.3	15	35.15	15	67.4	23	15.58	10	91.9	23
11.1	59.68	4	44.8	15	42.73	4	28.8	15	35.06	9	65.0	24	15.52	6	89.3	26
21.0	59.69	1	43.5	13	42.74	1	27.3	15	35.04	2	62.5	25	15.50	2	86.5	28
31.0	59.75	6	42.3	12	42.80	6	26.1	12	35.09	5	60.1	24	15.53	3	83.4	31
Apr. 10.0	59.85	10	41.4	9	42.90	10	25.1	10	35.21	12	57.8	23	15.62	9	80.2	32
19.9	60.00	15	40.8	6	43.05	15	24.4	7	35.41	20	55.8	20	15.75	13	76.9	33
29.9	60.19	19	40.5	3	43.25	20	24.0	4	35.68	27	54.2	16	15.94	19	73.6	33
May 9.9	60.43	24	40.5	0	43.49	24	24.0	0	36.02	34	53.0	12	16.19	25	70.4	32
19.9	60.71	28	40.9	4	43.77	28	24.3	3	36.41	39	52.2	8	16.48	29	67.3	31
29.8	61.02	31	41.7	8	44.09	32	25.1	8	36.85	44	52.0	2	16.81	33	64.4	29
June 8.8	61.36	34	42.9	12	44.43	34	26.2	11	37.32	47	52.2	2	17.18	37	61.7	27
18.8	61.71	35	44.4	15	44.78	35	27.6	14	37.81	49	52.9	7	17.57	39	59.4	23
28.8	62.07	36	46.1	17	45.14	36	29.3	17	38.31	50	54.1	12	17.97	40	57.4	20
July 8.7	62.42	35	48.1	20	45.50	36	31.3	20	38.80	49	55.8	17	18.38	41	55.9	15
18.7	62.76	34	50.3	22	45.85	35	33.5	22	39.28	48	57.8	20	18.79	41	54.8	11
28.7	63.09	33	52.7	24	46.18	33	35.9	24	39.73	45	60.2	24	19.18	39	54.3	5
Aug. 7.6	63.38	29	55.1	24	46.48	30	38.3	24	40.14	41	63.0	28	19.54	36	54.3	0
17.6	63.65	27	57.5	24	46.75	27	40.8	25	40.51	37	65.9	29	19.87	33	54.7	4
27.6	63.88	23	60.0	25	46.98	23	43.3	25	40.83	32	69.0	31	20.15	28	55.6	9
Sept. 6.6	64.08	20	62.3	23	47.18	20	45.7	24	41.10	27	72.3	33	20.38	23	56.9	13
16.5	64.23	15	64.6	23	47.34	16	48.0	23	41.31	21	75.6	33	20.56	18	58.7	18
26.5	64.34	11	66.7	21	47.46	12	50.2	22	41.46	15	78.9	33	20.68	12	60.7	20
Oct. 6.5	64.42	8	68.6	19	47.54	8	52.2	20	41.55	9	82.1	32	20.75	7	63.0	23
16.5	64.46	4	70.3	17	47.58	4	54.0	18	41.58	3	85.1	30	20.76	1	65.3	23
26.4	64.47	1	71.8	15	47.59	1	55.6	16	41.57	1	88.0	29	20.72	4	67.7	24
Nov. 5.4	64.45	2	73.0	12	47.56	3	57.0	14	41.50	7	90.6	26	20.64	8	70.1	24
15.4	64.40	5	74.0	10	47.51	5	58.0	10	41.39	11	92.9	23	20.51	13	72.2	21
25.3	64.33	7	74.7	7	47.44	7	58.8	8	41.23	16	94.8	19	20.36	15	74.1	19
Dec. 5.3	64.23	10	75.1	4	47.35	9	59.2	4	41.03	20	96.2	14	20.18	18	75.7	16
15.3	64.12	11	75.2	1	47.24	11	59.4	2	40.81	22	97.2	10	19.98	20	76.8	11
25.3	64.00	12	75.0	2	47.11	13	59.2	2	40.55	26	97.7	5	19.77	21	77.5	7
35.2	63.87	13	74.5	5	46.98	13	58.8	4	40.29	26	97.7	0	19.56	21	77.7	2
Sec δ, Tan δ	1.142		+0.551		1.159		+0.587		1.791		+1.486		1.454		−1.056	
Mean Place	$60^s.460$		41″.83		$43^s.542$		25″.42		$37^s.111$		57″.09		$15^s.766$		86″.42	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		−0.04		0.00		−0.04		+0.01		−0.10		0.00		+0.07	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.1		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*β* Ceti. Mag. 2.2				*o* Cassiopeiæ. Mag. 4.7				21 Cassiopeiæ. Mag. 5.6				*ζ* Andromedæ. Mag. 4.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 0 39		° ′ −18 27		h m 0 39		° ′ +47 48		h m 0 39		° ′ +74 30		h m 0 42		° ′ +23 47	
	s		″		s		″		s		″		s		″	
Jan. 0.3	16.84		35.1		55.30		67.2		55.18		87.8		46.66		68.3	
10.2	16.72	12	35.5	4	55.09	21	66.8	4	54.48	70	87.9	1	46.54	12	67.7	6
20.2	16.61	11	35.7	2	54.88	21	66.0	8	53.79	69	87.3	6	46.42	12	66.8	9
30.2	16.50	11	35.6	1	54.68	20	64.7	13	53.12	67	86.1	12	46.30	12	65.8	10
Feb. 9.1	16.41	9	35.3	3	54.50	18	63.1	16	52.51	61	84.4	17	46.19	11	64.7	11
19.1	16.33	8	34.6	7	54.35	15	61.2	19	52.00	51	82.3	21	46.10	9	63.5	12
Mar. 1.1	16.27	6	33.7	9	54.23	12	59.1	21	51.59	41	79.8	25	46.03	7	62.3	12
11.1	16.24	3	32.6	11	54.16	7	56.9	22	51.30	29	77.1	27	46.00	3	61.1	12
21.0	16.25	1	31.2	14	54.15	1	54.7	22	51.17	13	74.2	29	46.00	0	60.0	11
31.0	16.29	4	29.5	17	54.19	4	52.6	21	51.19	2	71.2	30	46.04	4	59.2	8
Apr. 10.0	16.37	8	27.6	19	54.30	11	50.7	19	51.36	17	68.4	28	46.13	9	58.5	7
20.0	16.50	13	25.6	20	54.47	17	49.1	16	51.69	33	65.8	26	46.27	14	58.1	4
29.9	16.67	17	23.3	23	54.70	23	47.8	13	52.17	48	63.5	23	46.45	18	58.1	0
May 9.9	16.87	20	21.0	23	54.99	29	46.9	9	52.77	60	61.6	19	46.68	23	58.4	3
19.9	17.12	25	18.6	24	55.33	34	46.5	4	53.48	71	60,1	15	46.94	26	59.0	6
29.8	17.40	28	16.1	25	55.70	37	46.5	0	54.28	80	59.2	9	47.24	30	59.9	9
June 8.8	17.70	30	13.7	24	56.11	41	46.9	4	55.15	87	58.8	4	47.56	32	61.2	13
18.8	18.02	32	11.4	23	56.54	43	47.8	9	56.05	90	59.0	2	47.89	33	62.8	16
28.8	18.35	33	9.3	21	56.97	43	49.2	14	56.97	92	59.7	7	48.24	35	64.6	18
July 8.7	18.68	33	7.3	20	57.40	43	50.9	17	57.89	92	60.9	12	48.58	34	66.6	20
18.7	19.01	33	5.6	17	57.82	42	53.0	21	58.78	89	62.6	17	48.92	34	68.7	21
28.7	19.32	31	4.2	14	58.21	39	55.4	24	59.61	83	64.8	22	49.24	32	70.9	22
Aug. 7.7	19.61	29	3.2	10	58.58	37	58.0	26	60.38	77	67.4	26	49.54	30	73.2	23
17.6	19.87	26	2.4	8	58.90	32	60.9	29	61.07	69	70.4	30	49.80	26	75.5	23
27.6	20.09	22	2.1	3	59.19	29	63.8	29	61.67	60	73.6	32	50.03	23	77.7	22
Sept. 6.6	20.28	19	2.1	0	59.43	24	66.8	30	62.16	49	77.1	35	50.23	20	79.8	21
16.5	20.44	16	2.4	3	59.62	19	69.8	30	62.53	37	80.8	37	50.39	16	81.8	20
26.5	20.55	11	3.0	6	59.76	14	72.8	30	62.80	27	84.5	37	50.51	12	83.6	18
Oct. 6.5	20.62	7	3.9	9	59.85	9	75.7	29	62.94	14	88.2	37	50.60	9	85.3	17
16.5	20.66	4	5.0	11	59.90	5	78.4	27	62.96	2	91.8	36	50.65	5	86.7	14
26.4	20.67	1	6.2	12	59.91	1	80.9	25	62.87	9	95.4	36	50.67	2	87.9	12
Nov. 5.4	20.64	3	7.5	13	59.87	4	83.2	23	62.66	21	98.7	33	50.66	1	88.9	10
15.4	20.59	5	8.8	13	59.79	8	85.1	19	62.35	31	101.6	29	50.62	4	89.6	7
25.4	20.52	7	10.0	12	59.68	11	86.6	15	61.92	43	104.2	26	50.56	6	90.1	5
Dec. 5.3	20.43	9	11.2	12	59.54	14	87.8	12	61.41	51	106.4	22	50.48	8	90.4	3
15.3	20.32	11	12.2	10	59.37	17	88.6	8	60.83	58	108.0	16	50.39	9	90.3	1
25.3	20.22	10	13.0	8	59.18	19	88.9	3	60.18	65	109.0	10	50.28	11	90.1	2
35.2	20.10	12	13.6	6	58.98	20	88.7	2	59.50	68	109.5	5	50.16	12	89.6	5
Sec δ, Tan δ	1.054		−0.334		1.489		+1.103		3.747		+3.611		1.093		+0.441	
Mean Place	$16^{s}.406$		$30''.23$		$55^{s}.622$		$50''.08$		$56^{s}.789$		$65''.50$		$46^{s}.622$		$58''.28$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		+0.02		+0.01		−0.07		+0.02		−0.24		0.00		−0.03	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**η Cassiopeiæ.** Mag. 3.6				**δ Piscium.** Mag. 4.6				**λ Hydri.** Mag. 5.0				**20 Ceti.** Mag. 4.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 43		+57 21		0 44		+ 7 7		0 45		−75 22		0 48		− 1 36	
	s		″		s		″		s		″		s		″	
Jan. 0.3	52.84	28	57.5	2	13.35	10	6.3	6	39.45	78	105.5	7	37.01	11	37.9	7
10.2	52.56	28	57.3	8	13.25	11	5.7	7	38.67	75	104.8	13	36.90	10	38.6	5
20.2	52.28	28	56.5	13	13.14	10	5.0	6	37.92	70	103.5	19	36.80	10	39.1	4
30.2	52.00	25	55.2	16	13.04	9	4.4	6	37.22	63	101.6	23	36.70	10	39.5	3
Feb. 9.1	51.75	21	53.6	20	12.95	8	3.8	6	36.59	54	99.3	28	36.60	8	39.8	2
19.1	51.54	17	51.6	23	12.87	5	3.2	4	36.05	44	96.5	32	36.52	6	40.0	0
Mar. 1.1	51.37	11	49.3	25	12.82	3	2.8	3	35.61	33	93.3	35	36.46	3	40.0	2
11.1	51.26	3	46.8	25	12.79	0	2.5	1	35.28	20	89.8	37	36.43	0	39.8	4
21.0	51.23	4	44.3	25	12.79	5	2.4	1	35.08	8	86.1	38	36.43	4	39.4	6
31.0	51.27	11	41.8	23	12.84	8	2.5	3	35.00	6	82.3	39	36.47	7	38.8	9
Apr. 10.0	51.38	20	39.5	21	12.92	12	2.8	6	35.06	19	78.4	39	36.54	12	37.9	11
20.0	51.58	27	37.4	17	13.04	17	3.4	9	35.25	33	74.5	37	36.66	16	36.8	14
29.9	51.85	34	35.7	14	13.21	21	4.3	12	35.58	45	70.8	35	36.82	20	35.4	16
May 9.9	52.19	39	34.3	9	13.42	24	5.5	14	36.03	57	67.3	33	37.02	24	33.8	17
19.9	52.58	45	33.4	4	13.66	28	6.9	16	36.60	68	64.0	30	37.26	27	32.1	19
29.8	53.03	48	33.0	1	13.94	30	8.5	18	37.28	77	61.0	25	37.53	29	30.2	21
June 8.8	53.51	51	33.1	6	14.24	32	10.3	19	38.05	83	58.5	21	37.82	31	28.1	21
18.8	54.02	52	33.7	11	14.56	32	12.2	20	38.88	89	56.4	16	38.13	32	26.0	21
28.8	54.54	52	34.8	15	14.88	33	14.2	21	39.77	92	54.8	10	38.45	32	23.9	21
July 8.7	55.06	50	36.3	19	15.21	31	16.3	20	40.69	91	53.8	4	38.77	32	21.8	19
18.7	55.56	47	38.2	23	15.52	31	18.3	20	41.60	89	53.4	2	39.09	30	19.9	18
28.7	56.03	44	40.5	26	15.83	28	20.3	19	42.49	84	53.6	7	39.39	29	18.1	17
Aug. 7.7	56.47	39	43.1	29	16.11	25	22.2	17	43.33	75	54.3	13	39.68	25	16.4	14
17.6	56.86	35	46.0	31	16.36	23	23.9	15	44.08	66	55.6	17	39.93	23	15.0	11
27.6	57.21	29	49.1	32	16.59	19	25.4	14	44.74	53	57.3	23	40.16	19	13.9	9
Sept. 6.6	57.50	23	52.3	33	16.78	15	26.8	11	45.27	40	59.6	26	40.35	16	13.0	7
16.5	57.73	17	55.6	33	16.93	12	27.9	9	45.67	24	62.2	28	40.51	12	12.3	3
26.5	57.90	12	58.9	32	17.05	8	28.8	6	45.91	9	65.0	30	40.63	8	12.0	1
Oct. 6.5	58.02	6	62.1	31	17.13	5	29.4	4	46.00	7	68.0	31	40.71	5	11.9	1
16.5	58.08	0	65.2	29	17.18	2	29.8	3	45.93	23	71.1	29	40.76	3	12.0	3
26.4	58.08	6	68.1	27	17.20	1	30.1	0	45.70	37	74.0	28	40.79	1	12.3	4
Nov. 5.4	58.02	10	70.8	24	17.19	3	30.1	1	45.33	50	76.8	25	40.78	3	12.7	6
15.4	57.92	15	73.2	20	17.16	5	30.0	3	44.83	60	79.3	20	40.75	5	13.3	7
25.4	57.77	19	75.2	15	17.11	7	29.7	4	44.23	69	81.3	15	40.70	7	14.0	7
Dec. 5.3	57.58	23	76.7	11	17.04	8	29.3	5	43.54	76	82.8	10	40.63	8	14.7	7
15.3	57.35	25	77.8	6	16.96	10	28.8	6	42.78	78	83.8	3	40.55	10	15.4	7
25.3	57.10	27	78.4	1	16.86	10	28.2	6	42.00	80	84.1	3	40.45	10	16.1	7
35.2	56.83		78.5		16.76		27.6		41.20		83.8		40.35		16.8	
Sec δ, Tan δ	1.854		+1.562		1.008		+0.125		3.964		−3.836		1.000		−0.028	
Mean Place	$53^{s}.350$		37″.94		$13^{s}.141$		2″.10		$36^{s}.956$		88″.52		$36^{s}.683$		39″.24	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.01		−0.10		0.00		−0.01		−0.02		+0.26		0.00		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cassiopeiæ. Mag. 2.2				μ Andromedæ. Mag. 3.9				α Sculptoris. Mag. 4.4				ε Piscium. Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 51		+60 15		0 51		+38 1		0 54		−29 48		0 58		+ 7 25	
	s		″		s		″		s		″		s		″	
Jan. 0.3	29.94		25.0		58.44		74.0		28.36		88.0		29.00		43.3	
10.2	29.62	32	24.9	1	58.28	16	73.5	5	28.21	15	88.3	3	28.89	11	42.7	6
20.2	29.30	32	24.3	6	58.12	16	72.7	8	28.07	14	88.3	0	28.78	11	42.1	6
30.2	28.98	32	23.2	11	57.96	16	71.6	11	27.94	13	88.0	3	28.67	11	41.4	7
Feb. 9.2	28.69	29	21.6	16	57.81	15	70.3	13	27.81	13	87.3	7	28.57	10	40.8	6
19.1	28.44	25	19.6	20	57.68	13	68.7	16	27.70	11	86.2	11	28.48	9	40.3	5
Mar. 1.1	28.23	21	17.3	23	57.58	10	67.0	17	27.62	8	84.8	14	28.42	6	39.8	5
11.1	28.10	13	14.9	24	57.52	6	65.2	18	27.56	6	83.0	18	28.37	5	39.5	3
21.0	28.03	7	12.3	26	57.51	1	63.4	18	27.54	2	81.0	20	28.36	1	39.4	1
31.0	28.05	2	9.8	25	57.54	3	61.8	16	27.56	2	78.8	22	28.39	3	39.5	1
Apr. 10.0	28.16	11	7.3	25	57.63	9	60.4	14	27.62	6	76.3	25	28.46	7	39.8	3
20.0	28.35	19	5.1	22	57.77	14	59.2	12	27.73	11	73.7	26	28.57	11	40.4	6
29.9	28.62	27	3.2	19	57.96	19	58.3	9	27.89	16	71.0	27	28.73	16	41.3	9
May 9.9	28.96	34	1.7	15	58.21	25	57.8	5	28.08	19	68.1	29	28.92	19	42.4	11
19.9	29.37	41	0.7	10	58.50	29	57.7	1	28.32	24	65.3	28	29.16	24	43.7	13
29.9	29.84	47	0.1	6	58.82	32	58.0	3	28.60	28	62.6	27	29.42	26	45.2	15
June 8.8	30.35	51	0.0	1	59.18	36	58.7	7	28.91	31	59.9	27	29.72	30	47.0	18
18.8	30.88	53	0.4	4	59.55	37	59.8	11	29.24	33	57.5	24	30.03	31	48.9	19
28.8	31.43	55	1.3	9	59.94	39	61.3	15	29.58	34	55.3	22	30.35	32	50.8	19
July 8.7	31.98	55	2.7	14	60.32	38	63.0	17	29.93	35	53.4	19	30.68	33	52.9	21
18.7	32.52	54	4.5	18	60.70	38	65.1	21	30.28	35	51.8	16	31.00	32	54.9	20
28.7	33.03	51	6.7	22	61.06	36	67.4	23	30.61	33	50.6	12	31.31	31	56.9	20
Aug. 7.7	33.50	47	9.3	26	61.40	34	69.8	24	30.92	31	49.9	7	31.59	28	58.7	18
17.6	33.93	43	12.1	28	61.70	30	72.4	26	31.21	29	49.5	4	31.86	27	60.4	17
27.6	34.31	38	15.2	31	61.97	27	75.0	26	31.46	25	49.6	1	32.09	23	62.0	16
Sept. 6.6	34.63	32	18.4	32	62.20	23	77.7	27	31.68	22	50.1	5	32.29	20	63.3	13
16.6	34.89	26	21.7	33	62.38	18	80.3	26	31.85	17	51.0	9	32.46	17	64.4	11
26.5	35.08	19	25.1	34	62.53	15	82.8	25	31.98	13	52.3	13	32.59	13	65.3	9
Oct. 6.5	35.22	14	28.4	33	62.64	11	85.2	24	32.07	9	53.8	15	32.69	10	66.0	7
16.5	35.29	7	31.7	33	62.70	6	87.4	22	32.12	5	55.5	17	32.75	6	66.4	4
26.4	35.30	1	34.7	30	62.73	3	89.4	20	32.13	1	57.3	18	32.79	4	66.6	2
Nov. 5.4	35.24	6	37.6	29	62.72	1	91.2	18	32.10	3	59.1	18	32.80	1	66.7	1
15.4	35.14	10	40.1	25	62.68	4	92.7	15	32.04	6	60.9	18	32.78	2	66.6	1
25.4	34.97	17	42.3	22	62.61	7	93.9	12	31.96	8	62.6	17	32.74	4	66.3	3
Dec. 5.3	34.76	21	44.0	17	62.52	9	94.8	9	31.86	10	64.1	15	32.68	6	65.9	4
15.3	34.51	25	45.3	13	62.40	12	95.3	5	31.74	12	65.4	13	32.60	8	65.4	5
25.3	34.23	28	46.1	8	62.26	14	95.4	1	31.60	14	66.3	9	32.51	9	64.9	5
35.3	33.92	31	46.4	3	62.11	15	95.2	2	31.46	14	66.9	6	32.40	11	64.3	6
Sec δ, Tan δ	2.016		+1.750		1.270		+0.782		1.153		−0.573		1.008		+0.130	
Mean Place	$30^{s}.436$		4″.63		$58^{s}.496$		59″.12		$27^{s}.699$		80″.10		$28^{s}.696$		38″.48	
$D'_{\psi}a$, $D_{\omega}a$	+0.01		−0.11		0.00		−0.05		0.00		+0.04		0.00		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Phœnicis. Mag. 3.4				μ Cassiopeiæ. Mag. 5.3				η Ceti. Mag. 3.6				β Andromedæ. Mag. 2.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 1 2		° ′ −47 10		h m 1 2		° ′ +54 29		h m 1 4		° ′ −10 37		h m 1 4		° ′ +35 9	
	s		″		s		″		s		″		s		″	
Jan. 0.3	15.78	22	58.0	2	32.08	24	75.9	1	16.31	11	77.4	6	54.79	15	67.8	4
10.2	15.56	21	58.2	4	31.84	25	75.8	6	16.20	11	78.0	4	54.64	15	67.4	6
20.2	15.35	21	57.8	8	31.59	25	75.2	10	16.09	12	78.4	2	54.49	15	66.8	10
30.2	15.14	20	57.0	13	31.34	23	74.2	15	15.97	10	78.6	1	54.34	15	65.8	13
Feb. 9.2	14.94	17	55.7	17	31.11	21	72.7	19	15.87	9	78.7	2	54.19	13	64.5	14
19.1	14.77	14	54.0	22	30.90	16	70.8	21	15.78	8	78.5	5	54.06	10	63.1	16
Mar. 1.1	14.63	10	51.8	25	30.74	11	68.7	23	15.70	5	78.0	6	53.96	7	61.5	16
11.1	14.53	6	49.3	27	30.63	5	66.4	24	15.65	1	77.4	9	53.89	3	59.9	15
21.0	14.47	1	46.6	31	30.58	1	64.0	24	15.64	1	76.5	12	53.86	2	58.4	15
31.0	14.46	5	43.5	32	30.59	9	61.6	22	15.65	6	75.3	14	53.88	7	56.9	13
Apr. 10.0	14.51	10	40.3	33	30.68	17	59.4	21	15.71	10	73.9	16	53.95	12	55.6	11
20.0	14.61	15	37.0	34	30.85	24	57.3	17	15.81	15	72.3	19	54.07	18	54.5	7
29.9	14.76	21	33.6	33	31.09	30	55.6	14	15.96	18	70.4	20	54.25	22	53.8	5
May 9.9	14.97	26	30.3	33	31.39	37	54.2	10	16.14	22	68.4	21	54.47	28	53.3	0
19.9	15.23	30	27.0	31	31.76	41	53.2	5	16.36	26	66.3	22	54.75	30	53.3	3
29.9	15.53	35	23.9	28	32.17	45	52.7	0	16.62	29	64.1	23	55.05	34	53.6	7
June 8.8	15.88	38	21.1	25	32.62	48	52.7	4	16.91	30	61.8	23	55.39	37	54.3	10
18.8	16.26	39	18.6	22	33.10	50	53.1	9	17.21	32	59.5	22	55.76	37	55.3	14
28.8	16.65	41	16.4	17	33.60	50	54.0	13	17.53	33	57.3	20	56.13	38	56.7	17
July 8.7	17.06	41	14.7	13	34.10	49	55.3	17	17.86	32	55.3	19	56.51	37	58.4	20
18.7	17.47	40	13.4	8	34.59	47	57.0	21	18.18	31	53.4	17	56.88	35	60.4	21
28.7	17.87	38	12.6	3	35.06	44	59.1	24	18.49	29	51.7	13	57.23	34	62.5	23
Aug. 7.7	18.25	34	12.3	3	35.50	40	61.5	26	18.78	27	50.4	11	57.57	31	64.8	25
17.6	18.59	31	12.6	8	35.90	36	64.1	29	19.05	24	49.3	8	57.88	27	67.3	24
27.6	18.90	26	13.4	12	36.26	31	67.0	30	19.29	21	48.5	5	58.15	24	69.7	25
Sept. 6.6	19.16	21	14.6	16	36.57	27	70.0	31	19.50	17	48.0	1	58.39	20	72.2	24
16.6	19.37	16	16.2	20	36.84	20	73.1	31	19.67	13	47.9	2	58.59	16	74.6	24
26.5	19.53	10	18.2	23	37.04	16	76.2	30	19.80	10	48.1	4	58.75	12	77.0	22
Oct. 6.5	19.63	4	20.5	25	37.20	10	79.2	30	19.90	7	48.5	7	58.87	8	79.2	21
16.5	19.67	0	23.0	25	37.30	4	82.2	28	19.97	3	49.2	9	58.95	5	81.3	18
26.4	19.67	6	25.5	25	37.34	0	85.0	26	20.00	1	50.1	9	59.00	1	83.1	17
Nov. 5.4	19.61	10	28.0	24	37.34	5	87.6	23	20.01	2	51.0	11	59.01	2	84.8	14
15.4	19.51	14	30.4	21	37.29	10	89.9	19	19.99	5	52.1	11	58.99	5	86.2	11
25.4	19.37	16	32.5	18	37.19	14	91.8	16	19.94	7	53.2	10	58.94	8	87.3	8
Dec. 5.3	19.21	19	34.3	14	37.05	17	93.4	11	19.87	8	54.2	10	58.86	10	88.1	5
15.3	19.02	21	35.7	9	36.88	21	94.5	7	19.79	9	55.2	8	58.76	13	88.6	1
25.3	18.81	22	36.6	5	36.67	23	95.2	2	19.70	11	56.0	8	58.63	14	88.7	2
35.3	18.59		37.1		36.44		95.4		19.59		56.8		58.49		88.5	
Sec δ, Tan δ	1.471		−1.079		1.722		+1.402		1.017		−0.188		1.223		+0.705	
Mean Place	$14^{s}.767$		$45''.91$		$32^{s}.296$		$56''.50$		$15^{s}.810$		$76''.06$		$54^{s}.710$		$53''.47$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		+0.07		+0.01		−0.09		0.00		+0.01		+0.01		−0.05	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Piscium. Mag. 4.7				ζ Piscium. Mag. 5.6				κ Tucanæ. Mag. 5.0				f Piscium. Mag. 5.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 1 6		° ′ +29 38		h m 1 9		° ′ + 7 7		h m 1 12		° ′ −69 19		h m 1 13		° ′ + 3 9	
	s		″		s		″		s		″		s		″	
Jan. 0.3	55.35		12.7		14.57		20.2		53.37		73.9		22.14		46.5	
10.2	55.22	13	12.3	4	14.46	11	19.6	6	52.83	54	73.8	1	22.03	11	45.8	7
20.2	55.08	14	11.6	7	14.35	11	19.0	6	52.30	53	73.0	8	21.92	11	45.2	6
30.2	54.94	14	10.7	9	14.24	11	18.3	7	51.78	52	71.7	13	21.81	11	44.7	5
Feb. 9.2	54.81	13	9.5	12	14.14	10	17.7	6	51.31	47	69.8	19	21.70	11	44.2	5
19.1	54.69	12	8.3	12	14.04	10	17.2	5	50.88	43	67.5	23	21.61	9	43.9	3
Mar. 1.1	54.60	9	6.9	14	13.97	7	16.8	4	50.51	37	64.7	28	21.53	8	43.6	3
11.1	54.53	7	5.6	13	13.92	5	16.5	3	50.22	29	61.5	32	21.47	6	43.6	0
21.1	54.50	3	4.3	13	13.90	2	16.4	1	50.01	21	58.1	34	21.45	2	43.7	1
31.0	54.52	2	3.1	12	13.91	1	16.5	1	49.89	12	54.4	37	21.46	1	44.0	3
Apr. 10.0	54.59	7	2.1	10	13.97	6	16.9	4	49.87	2	50.6	38	21.52	6	44.6	6
20.0	54.71	12	1.3	8	14.07	10	17.5	6	49.95	8	46.8	38	21.61	9	45.4	8
29.9	54.87	16	0.8	5	14.22	15	18.3	8	50.13	18	43.0	38	21.75	14	46.5	11
May 9.9	55.08	21	0.7	1	14.41	19	19.4	11	50.40	27	39.3	37	21.93	18	47.8	13
19.9	55.34	26	0.9	2	14.63	22	20.7	13	50.77	37	35.8	35	22.15	22	49.3	15
29.9	55.64	30	1.5	6	14.89	26	22.2	15	51.23	46	32.6	32	22.40	25	51.0	17
June 8.8	55.96	32	2.4	9	15.18	29	23.9	17	51.76	53	29.8	28	22.69	29	52.8	18
18.8	56.30	34	3.6	12	15.49	31	25.8	19	52.35	59	27.3	25	22.99	30	54.8	20
28.8	56.66	36	5.1	15	15.81	32	27.8	20	52.99	64	25.3	20	23.30	31	56.8	20
July 8.8	57.02	36	6.8	17	16.14	33	29.8	20	53.66	67	23.8	15	23.63	33	58.8	20
18.7	57.38	36	8.8	20	16.46	32	31.8	20	54.34	68	22.9	9	23.95	32	60.8	20
28.7	57.72	34	11.0	22	16.77	31	33.7	19	55.01	67	22.6	3	24.26	31	62.7	19
Aug. 7.7	58.04	32	13.2	22	17.06	29	35.6	19	55.66	65	22.8	2	24.55	29	64.4	17
17.6	58.34	30	15.5	23	17.33	27	37.3	17	56.26	60	23.6	8	24.82	27	66.0	16
27.6	58.60	26	17.8	23	17.57	24	38.8	15	56.80	54	25.0	14	25.07	25	67.3	13
Sept. 6.6	58.83	23	20.1	23	17.78	21	40.1	13	57.25	45	26.9	19	25.28	21	68.4	11
16.6	59.02	19	22.3	22	17.96	18	41.1	10	57.62	37	29.2	23	25.46	18	69.3	9
26.5	59.18	16	24.3	20	18.10	14	42.0	9	57.88	26	31.8	26	25.61	15	69.9	6
Oct. 6.5	59.30	12	26.3	20	18.21	11	42.6	6	58.03	15	34.7	29	25.72	11	70.3	4
16.5	59.38	8	28.0	17	18.29	8	43.0	4	58.07	4	37.8	31	25.80	8	70.5	2
26.5	59.42	4	29.6	16	18.34	5	43.2	2	58.00	7	40.8	30	25.84	4	70.4	1
Nov. 5.4	59.44	2	30.9	13	18.35	1	43.2	0	57.83	17	43.7	29	25.86	2	70.2	2
15.4	59.42	2	32.0	11	18.34	1	43.1	1	57.56	27	46.4	27	25.86	0	69.8	4
25.4	59.38	4	32.8	8	18.31	3	42.8	3	57.20	36	48.8	24	25.83	3	69.4	4
Dec. 5.3	59.32	6	33.4	6	18.26	5	42.4	4	56.77	43	50.7	19	25.77	6	68.8	6
15.3	59.23	9	33.7	3	18.19	7	41.9	5	56.29	48	52.1	14	25.70	7	68.2	6
25.3	59.12	11	33.7	0	18.10	9	41.3	6	55.77	52	52.9	8	25.62	8	67.5	7
35.3	58.99	13	33.5	2	18.00	10	40.7	6	55.23	54	53.2	3	25.52	10	66.9	6
Sec δ, Tan δ	1.151		+0.569		1.008		+0.125		2.833		−2.651		1.001		+0.055	
Mean Place	$55^{\mathrm{s}}.199$		0″.05		$14^{\mathrm{s}}.202$		15″.12		$51^{\mathrm{s}}.191$		58″.65		$21^{\mathrm{s}}.710$		42″.65	
$D'_\psi\alpha$, $D_\omega\alpha$	0.00		−0.04		0.00		−0.01		−0.02		+0.18		0.00		0.00	
$D_\psi\delta$, $D_\omega\delta$	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	υ Piscium. Mag. 4.7				θ Ceti. Mag. 3.8				δ Cassiopeiæ. Mag. 2.8				γ Phœnicis. Mag. 3.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 1 14		° ′ +26 48		h m 1 19		° ′ −8 37		h m 1 20		° ′ +59 47		h m 1 24		° ′ −43 44	
	s		″		s		″		s		″		s		″	
Jan. 0.3	44.38		56.4		44.02		36.6		10.65		40.8		38.99		102.0	
10.3	44.26	12	56.0	4	43.91	11	37.3	7	10.35	30	41.1	3	38.79	20	102.5	5
20.2	44.13	13	55.3	7	43.80	11	37.8	5	10.03	32	40.8	3	38.58	21	102.4	1
30.2	43.99	14	54.5	8	43.68	12	38.2	4	9.71	32	40.0	8	38.37	21	101.9	5
Feb. 9.2	43.86	13	53.5	10	43.57	11	38.3	1	9.41	30	38.8	12	38.18	19	101.0	9
19.1	43.74	12	52.3	12	43.46	11	38.2	1	9.13	28	37.1	17	38.00	18	99.6	14
Mar. 1.1	43.64	10	51.1	12	43.38	8	37.9	3	8.89	24	35.1	20	37.84	16	97.7	19
11.1	43.57	7	49.9	12	43.32	6	37.3	6	8.72	17	32.8	23	37.72	12	95.5	22
21.1	43.54	3	48.7	12	43.28	4	36.5	8	8.61	11	30.3	25	37.64	8	93.0	25
31.0	43.55	1	47.7	10	43.28	0	35.5	10	8.57	4	27.9	24	37.60	4	90.2	28
Apr. 10.0	43.61	6	46.9	8	43.33	5	34.3	12	8.63	6	25.4	25	37.61	1	87.1	31
20.0	43.72	11	46.2	7	43.41	8	32.8	15	8.76	13	23.2	22	37.68	7	84.0	31
30.0	43.87	15	45.9	3	43.54	13	31.1	17	8.99	23	21.2	20	37.80	12	80.7	33
May 9.9	44.07	20	45.9	0	43.71	17	29.2	19	9.29	30	19.5	17	37.97	17	77.4	33
19.9	44.32	25	46.2	3	43.92	21	27.1	21	9.66	37	18.2	13	38.20	23	74.1	33
29.9	44.60	28	46.8	6	44.17	25	25.0	21	10.10	44	17.3	9	38.47	27	71.0	31
June 8.8	44.91	31	47.8	10	44.44	27	22.8	22	10.58	48	16.9	4	38.78	31	68.0	30
18.8	45.25	34	49.1	13	44.74	30	20.5	23	11.10	52	17.0	1	39.12	34	65.3	27
28.8	45.60	35	50.6	15	45.05	31	18.3	22	11.64	54	17.6	6	39.49	37	62.9	24
July 8.8	45.95	35	52.3	17	45.38	33	16.3	20	12.19	55	18.6	10	39.88	39	61.0	19
18.7	46.30	35	54.3	20	45.70	32	14.4	19	12.74	55	20.1	15	40.27	39	59.4	16
28.7	46.64	34	56.3	20	46.01	31	12.7	17	13.27	53	22.0	19	40.65	38	58.4	10
Aug. 7.7	46.96	32	58.5	22	46.30	29	11.2	15	13.77	50	24.2	22	41.02	37	57.8	6
17.7	47.25	29	60.7	22	46.58	28	10.0	12	14.24	47	26.7	25	41.37	35	57.8	0
27.6	47.52	27	62.9	22	46.83	25	9.1	9	14.66	42	29.5	28	41.68	31	58.2	4
Sept. 6.6	47.75	23	65.0	21	47.04	21	8.5	6	15.03	37	32.5	30	41.95	27	59.2	10
16.6	47.95	20	67.0	20	47.23	19	8.3	2	15.34	31	35.7	32	42.18	23	60.6	14
26.5	48.11	16	68.9	19	47.38	15	8.4	1	15.60	26	38.9	32	42.36	18	62.5	19
Oct. 6.5	48.23	12	70.7	18	47.50	12	8.7	3	15.80	20	42.1	32	42.48	12	64.6	21
16.5	48.32	9	72.3	16	47.58	8	9.3	6	15.93	13	45.3	32	42.56	8	66.9	23
26.5	48.38	6	73.7	14	47.63	5	10.1	8	16.00	7	48.4	31	42.59	3	69.4	25
Nov. 5.4	48.40	2	74.8	11	47.65	2	11.0	9	16.01	1	51.2	28	42.57	2	71.9	25
15.4	48.40	0	75.8	10	47.64	1	12.0	10	15.96	5	53.9	27	42.51	6	74.3	24
25.4	48.37	3	76.5	7	47.61	3	13.0	10	15.86	10	56.2	23	42.41	10	76.6	23
Dec. 5.4	48.31	6	77.0	5	47.55	6	14.0	10	15.70	16	58.2	20	42.27	14	78.6	20
15.3	48.23	8	77.2	2	47.48	7	15.0	10	15.50	20	59.7	15	42.11	16	80.2	16
25.3	48.13	10	77.2	0	47.39	9	15.9	9	15.25	25	60.8	11	41.93	18	81.4	12
35.3	48.01	12	76.9	3	47.28	11	16.7	8	14.96	29	61.4	6	41.73	20	82.2	8
Sec δ, Tan δ	1.121		+0.506		1.011		−0.152		1.988		+1.718		1.384		−0.957	
Mean Place	$44^{\mathrm{s}}.146$		$44''.43$		$43^{\mathrm{s}}.451$		$36''.56$		$10^{\mathrm{s}}.740$		$19''.90$		$37^{\mathrm{s}}.892$		$91''.64$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.03		0.00		+0.01		+0.02		−0.11		−0.01		+0.06	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**38 Cassiopeiæ.** Mag. 6.0				**η Piscium.** Mag. 3.7				**40 Cassiopeiæ.** Mag. 5.5				**υ Andromedæ.** Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 24		+69 49		1 26		+14 54		1 31		+72 36		1 31		+40 58	
	s		″		s		″		s		″		s		″	
Jan. 0.3	48.31		43.8		53.13		18.5		36.91		31.5		44.87		49.2	
		49		6		11		5		57		7		16		0
10.3	47.82		44.4		53.02		18.0		36.34		32.2		44.71		49.2	
		51		1		11		6		61		1		18		4
20.2	47.31		44.3		52.91		17.4		35.73		32.3		44.53		48.8	
		51		6		12		7		61		5		18		8
30.2	46.80		43.7		52.79		16.7		35.12		31.8		44.35		48.0	
		50		11		12		7		59		10		18		11
Feb. 9.2	46.30		42.6		52.67		16.0		34.53		30.8		44.17		46.9	
		45		17		11		8		54		16		17		13
19.1	45.85		40.9		52.56		15.2		33.99		29.2		44.00		45.6	
		38		21		10		7		47		21		14		16
Mar. 1.1	45.47		38.8		52.46		14.5		33.52		27.1		43.86		44.0	
		30		24		7		6		38		23		11		17
11.1	45.17		36.4		52.39		13.9		33.14		24.8		43.75		42.3	
		20		26		3		5		26		27		7		18
21.1	44.97		33.8		52.36		13.4		32.88		22.1		43.68		40.5	
		9		28		0		4		13		27		1		17
31.0	44.88		31.0		52.36		13.0		32.75		19.4		43.67		38.8	
		4		27		4		2		1		28		4		16
Apr. 10.0	44.92		28.3		52.40		12.8		32.76		16.6		43.71		37.2	
		16		26		9		1		15		28		9		14
20.0	45.08		25.7		52.49		12.9		32.91		13.8		43.80		35.8	
		28		24		13		3		29		25		15		12
30.0	45.36		23.3		52.62		13.2		33.20		11.3		43.95		34.6	
		39		21		18		6		43		22		22		9
May 9.9	45.75		21.2		52.80		13.8		33.63		9.1		44.17		33.7	
		49		18		22		9		54		19		26		5
19.9	46.24		19.4		53.02		14.7		34.17		7.2		44.43		33.2	
		58		12		25		12		64		14		30		2
29.9	46.82		18.2		53.27		15.9		34.81		5.8		44.73		33.0	
		65		8		29		13		73		10		35		3
June 8.8	47.47		17.4		53.56		17.2		35.54		4.8		45.08		33.3	
		71		3		31		16		79		4		37		6
18.8	48.18		17.1		53.87		18.8		36.33		4.4		45.45		33.9	
		74		2		32		17		83		0		39		10
28.8	48.92		17.3		54.19		20.5		37.16		4.4		45.84		34.9	
		75		7		33		19		85		6		40		13
July 8.8	49.67		18.0		54.52		22.4		38.01		5.0		46.24		36.2	
		75		12		33		19		86		11		40		16
18.7	50.42		19.2		54.85		24.3		38.87		6.1		46.64		37.8	
		73		17		33		20		84		15		39		19
28.7	51.15		20.9		55.18		26.3		39.71		7.6		47.03		39.7	
		70		21		30		19		80		20		37		21
Aug. 7.7	51.85		23.0		55.48		28.2		40.51		9.6		47.40		41.8	
		65		25		29		19		74		24		35		23
17.7	52.50		25.5		55.77		30.1		41.25		12.0		47.75		44.1	
		59		28		26		17		69		27		32		24
27.6	53.09		28.3		56.03		31.8		41.94		14.7		48.07		46.5	
		52		31		23		16		60		31		28		25
Sept. 6.6	53.61		31.4		56.26		33.4		42.54		17.8		48.35		49.0	
		44		32		19		15		52		32		24		25
16.6	54.05		34.6		56.45		34.9		43.06		21.0		48.59		51.5	
		36		35		17		12		43		34		21		25
26.5	54.41		38.1		56.62		36.1		43.49		24.4		48.80		54.0	
		27		35		13		11		33		35		16		24
Oct. 6.5	54.68		41.6		56.75		37.2		43.82		27.9		48.96		56.4	
		18		35		10		8		22		36		12		24
16.5	54.86		45.1		56.85		38.0		44.04		31.5		49.08		58.8	
		9		34		6		7		12		35		8		21
26.5	54.95		48.5		56.91		38.7		44.16		35.0		49.16		60.9	
		0		33		4		5		1		34		5		20
Nov. 5.4	54.95		51.8		56.95		39.2		44.17		38.4		49.21		62.9	
		9		30		1		2		10		32		1		17
15.4	54.86		54.8		56.96		39.4		44.07		41.6		49.22		64.6	
		19		28		2		1		21		29		3		15
25.4	54.67		57.6		56.94		39.5		43.86		44.5		49.19		66.1	
		26		24		4		0		30		25		7		12
Dec. 5.4	54.41		60.0		56.90		39.5		43.56		47.0		49.12		67.3	
		34		19		6		2		40		21		10		9
15.3	54.07		61.9		56.84		39.3		43.16		49.1		49.02		68.2	
		41		15		9		3		47		16		12		5
25.3	53.66		63.4		56.75		39.0		42.69		50.7		48.90		68.7	
		46		9		10		5		54		11		15		1
35.3	53.20		64.3		56.65		38.5		42.15		51.8		48.75		68.8	
Sec δ, Tan δ	2.900		+2.722		1.035		+0.266		3.346		+3.193		1.325		+0.869	
Mean Place	$48^{s}.565$		21″.10		$52^{s}.718$		10″.21		$37^{s}.106$		8″.32		$44^{s}.617$		32″.63	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.03		−0.18		0.00		−0.02		+0.03		−0.20		+0.01		−0.05	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

Mean Solar Date.	π Piscium. Mag. 5.6				υ Persei. Mag. 3.8				α Eridani. Mag. 0.6				ω Cassiopeiæ. Mag. 5.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 32		+11 42		1 32		+48 11		1 34		−57 39		1 35		+67 36	
	s		″		s		″		s		″		s		″	
Jan. 0.3	32.70		14.3		42.55		52.9		32.37		97.3		57.22		53.4	
10.3	32.59	11	13.8	5	42.36	19	53.0	1	32.05	32	97.7	4	56.80	42	54.0	6
20.2	32.48	11	13.2	6	42.15	21	52.7	3	31.72	33	97.5	2	56.35	45	54.1	1
30.2	32.36	12	12.5	7	41.93	22	52.0	7	31.40	32	96.8	7	55.89	46	53.6	5
Feb. 9.2	32.24	12	11.9	6	41.71	22	50.8	12	31.09	31	95.5	13	55.44	45	52.5	11
19.2	32.13	11	11.3	6	41.51	20	49.4	14	30.81	28	93.7	18	55.03	41	51.0	15
Mar. 1.1	32.03	10	10.7	6	41.34	17	47.7	17	30.56	25	91.4	23	54.67	36	49.1	19
11.1	31.96	7	10.2	5	41.21	13	45.8	19	30.35	21	88.8	26	54.38	29	46.8	23
21.1	31.92	4	9.9	3	41.13	8	43.7	21	30.19	16	85.8	30	54.18	20	44.2	26
31.0	31.91	1	9.7	2	41.10	3	41.7	20	30.09	10	82.5	33	54.09	9	41.6	26
Apr. 10.0	31.94	3	9.7	0	41.13	3	39.8	19	30.06	3	79.1	34	54.10	1	38.9	27
20.0	32.03	9	10.0	3	41.23	10	38.0	18	30.09	3	75.5	36	54.22	12	36.4	25
30.0	32.15	12	10.5	5	41.40	17	36.4	16	30.20	11	71.8	37	54.45	23	34.0	24
May 9.9	32.32	17	11.3	8	41.63	23	35.2	12	30.37	17	68.2	36	54.79	34	31.9	21
19.9	32.53	21	12.3	10	41.92	29	34.3	9	30.62	25	64.7	35	55.23	44	30.2	17
29.9	32.78	25	13.6	13	42.26	34	33.8	5	30.92	30	61.3	34	55.75	52	28.9	13
June 8.9	33.06	28	15.0	14	42.64	38	33.8	0	31.28	36	58.2	31	56.34	59	28.0	9
18.8	33.36	30	16.7	17	43.05	41	34.1	3	31.69	41	55.5	27	56.98	64	27.6	4
28.8	33.68	32	18.5	18	43.48	43	34.9	8	32.14	45	53.1	24	57.65	67	27.8	2
July 8.8	34.01	33	20.4	19	43.92	44	36.0	11	32.61	47	51.2	19	58.35	70	28.5	7
18.7	34.33	32	22.3	19	44.36	44	37.6	16	33.09	48	49.8	14	59.04	69	29.6	11
28.7	34.65	32	24.2	19	44.79	43	39.4	18	33.57	48	48.9	9	59.73	69	31.1	15
Aug. 7.7	34.96	31	26.1	19	45.20	41	41.5	21	34.04	47	48.6	3	60.38	65	33.1	20
17.7	35.24	28	27.9	18	45.58	38	43.9	24	34.48	44	48.9	3	60.99	61	35.5	24
27.6	35.50	26	29.5	16	45.93	35	46.4	25	34.88	40	49.8	9	61.56	57	38.1	26
Sept. 6.6	35.73	23	30.9	14	46.24	31	49.1	27	35.23	35	51.2	14	62.06	50	41.1	30
16.6	35.93	20	32.2	13	46.51	27	51.8	27	35.52	29	53.0	18	62.49	43	44.2	31
26.6	36.10	17	33.3	11	46.74	23	54.6	28	35.75	23	55.3	23	62.85	36	47.5	33
Oct. 6.5	36.24	14	34.1	8	46.92	18	57.3	27	35.91	16	57.8	25	63.13	28	50.9	34
16.5	36.34	10	34.8	7	47.05	13	60.0	27	36.00	9	60.6	28	63.33	20	54.3	34
26.5	36.41	7	35.2	4	47.14	9	62.5	25	36.02	2	63.5	29	63.45	12	57.7	34
Nov. 5.4	36.45	4	35.5	3	47.19	5	64.9	24	35.97	5	66.4	29	63.49	4	60.9	32
15.4	36.47	2	35.6	1	47.19	0	67.0	21	35.86	11	69.2	28	63.44	5	63.9	30
25.4	36.46	1	35.6	0	47.15	4	68.9	19	35.70	16	71.7	25	63.31	13	66.7	28
Dec. 5.4	36.42	4	35.4	2	47.06	9	70.4	15	35.48	22	73.9	22	63.11	20	69.1	24
15.3	36.36	6	35.0	4	46.94	12	71.6	12	35.22	26	75.7	18	62.83	28	71.0	19
25.3	36.28	8	34.6	4	46.79	15	72.4	8	34.93	29	77.0	13	62.48	35	72.5	15
35.3	36.18	10	34.1	5	46.61	18	72.8	4	34.61	32	77.7	7	62.09	39	73.5	10
Sec δ, Tan δ	1.021		+0.207		1.500		+1.118		1.870		−1.580		2.626		+2.428	
Mean Place	32ˢ.221		6″.95		42ˢ.352		34″.35		30ˢ.743		84″.63		57ˢ.204		30″.89	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.01		+0.01		−0.07		−0.02		+0.10		+0.03		−0.15	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*ν* Piscium. Mag. 4.7				*φ* Persei. Mag. 4.2				*τ* Ceti. Mag. 3.6				*ο* Piscium. Mag. 4.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 36		+ 5 3		1 38		+50 15		1 40		−16 22		1 40		+ 8 43	
	s		″		s		″		s		″		s		″	
Jan. 0.3	57.81		15.3		15.97		40.6		5.10		85.8		51.57		37.5	
10.3	57.71	10	14.7	6	15.77	20	40.8	2	4.98	12	86.5	7	51.47	10	36.9	6
20.2	57.60	11	14.1	6	15.54	23	40.6	2	4.85	13	87.0	5	51.35	12	36.3	6
30.2	57.48	12	13.6	5	15.31	23	39.9	7	4.71	14	87.2	2	51.23	12	35.7	6
Feb. 9.2	57.36	12	13.1	5	15.08	23	38.8	11	4.58	13	87.2	0	51.11	12	35.2	5
19.2	57.25	11	12.7	4	14.86	22	37.4	14	4.46	12	86.9	3	51.00	11	34.6	6
Mar. 1.1	57.15	10	12.4	3	14.67	19	35.7	17	4.35	11	86.2	7	50.90	10	34.2	4
11.1	57.08	7	12.2	2	14.53	14	33.8	19	4.26	9	85.3	9	50.82	8	33.9	3
21.1	57.03	5	12.2	0	14.43	10	31.7	21	4.20	6	84.1	12	50.77	5	33.7	2
31.0	57.02	1	12.4	2	14.39	4	29.6	21	4.17	3	82.7	14	50.76	1	33.7	0
Apr. 10.0	57.05	3	12.8	4	14.42	3	27.6	20	4.18	1	81.0	17	50.79	3	33.9	2
20.0	57.12	7	13.5	7	14.51	9	25.7	19	4.24	6	79.0	20	50.86	7	34.3	4
30.0	57.24	12	14.4	9	14.68	17	24.1	16	4.34	10	76.9	21	50.97	11	35.0	7
May 9.9	57.40	16	15.5	11	14.91	23	22.7	14	4.49	15	74.6	23	51.13	16	35.9	9
19.9	57.61	21	16.9	14	15.20	29	21.7	10	4.68	19	72.2	24	51.33	20	37.1	12
29.9	57.84	23	18.4	15	15.54	34	21.1	6	4.91	23	69.7	25	51.57	24	38.5	14
June 8.9	58.11	27	20.2	18	15.93	39	20.9	2	5.16	25	67.2	25	51.84	27	40.0	15
18.8	58.41	30	22.0	18	16.35	42	21.1	2	5.45	29	64.8	24	52.14	30	41.7	17
28.8	58.72	31	23.9	19	16.79	44	21.7	6	5.76	31	62.5	23	52.45	31	43.6	19
July 8.8	59.04	32	25.9	20	17.25	46	22.8	11	6.08	32	60.3	22	52.78	33	45.5	19
18.7	59.36	32	27.8	19	17.70	45	24.2	14	6.40	32	58.3	20	53.10	32	47.4	19
28.7	59.68	32	29.7	19	18.15	45	26.0	18	6.72	32	56.6	17	53.42	32	49.3	19
Aug. 7.7	59.98	30	31.5	18	18.58	43	28.1	21	7.02	30	55.3	13	53.73	31	51.1	18
17.7	60.27	29	33.1	16	18.98	40	30.4	23	7.31	29	54.3	10	54.02	29	52.7	16
27.6	60.53	26	34.5	14	19.34	36	32.9	25	7.57	26	53.6	7	54.28	26	54.3	16
Sept. 6.6	60.76	23	35.6	11	19.67	33	35.6	27	7.80	23	53.3	3	54.51	23	55.6	13
16.6	60.96	20	36.6	10	19.96	29	38.3	27	8.00	20	53.4	1	54.72	21	56.7	11
26.6	61.13	17	37.3	7	20.20	24	41.1	28	8.17	17	53.9	5	54.89	17	57.6	9
Oct. 6.5	61.26	13	37.7	4	20.40	20	43.9	28	8.30	13	54.6	7	55.04	15	58.3	7
16.5	61.36	10	38.0	3	20.54	14	46.7	28	8.40	10	55.6	10	55.15	11	58.7	4
26.5	61.44	8	38.0	0	20.64	10	49.3	26	8.46	6	56.9	13	55.23	8	59.0	3
Nov. 5.4	61.48	4	37.9	1	20.70	6	51.8	25	8.49	3	58.2	13	55.27	4	59.0	0
15.4	61.50	2	37.6	3	20.71	1	54.0	22	8.49	0	59.6	14	55.29	2	58.9	1
25.4	61.49	1	37.1	5	20.67	4	56.0	20	8.46	3	61.1	15	55.29	0	58.7	2
Dec. 5.4	61.45	4	36.6	5	20.58	9	57.7	17	8.41	5	62.5	14	55.26	3	58.4	3
15.3	61.39	6	36.1	5	20.46	12	59.0	13	8.33	8	63.7	12	55.21	5	58.0	4
25.3	61.32	7	35.5	6	20.30	16	59.9	9	8.24	9	64.8	11	55.13	8	57.5	5
35.3	61.23	9	34.8	7	20.11	19	60.4	5	8.13	11	65.7	9	55.04	9	56.9	6
Sec δ, Tan δ	1.004		+0.089		1.564		+1.203		1.042		−0.294		1.012		+0.153	
Mean Place	$57^s.258$		$10''.11$		$15^s.729$		$21''.47$		$4^s.335$		$83''.89$		$51^s.021$		$30''.92$	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		−0.01		+0.01		−0.07		0.00		+0.02		0.00		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Sculptoris. Mag. 5.4				ζ Ceti. Mag. 3.9				α Trianguli. Mag. 3.6				ε Cassiopeiæ. Mag. 3.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 1 41		° ′ −25 28		h m 1 47		° ′ −10 45		h m 1 48		° ′ +29 9		h m 1 48		° ′ +63 14	
	s		″		s		″		s		″		s		″	
Jan. 0.3	37.76		59.7		13.65		33.9		10.97		50.7		11.90		71.6	
10.3	37.62	14	60.4	7	13.54	11	34.6	7	10.85	12	50.5	2	11.57	33	72.3	7
20.2	37.48	14	60.9	5	13.42	12	35.2	6	10.71	14	50.1	4	11.21	36	72.4	1
30.2	37.33	15	61.0	1	13.29	13	35.6	4	10.56	15	49.4	7	10.84	37	72.0	4
Feb. 9.2	37.19	14	60.7	3	13.17	12	35.7	1	10.41	15	48.5	9	10.47	37	71.1	9
19.2	37.05	14	60.0	7	13.05	12	35.6	1	10.27	14	47.5	10	10.12	35	69.7	14
Mar. 1.1	36.93	12	59.0	10	12.94	11	35.2	4	10.15	12	46.4	11	9.81	31	67.9	18
11.1	36.83	10	57.7	13	12.85	9	34.6	6	10.05	10	45.2	12	9.56	25	65.8	21
21.1	36.76	7	56.1	16	12.79	6	33.8	8	9.98	7	44.0	12	9.38	18	63.4	24
31.1	36.73	3	54.2	19	12.77	2	32.7	11	9.95	3	42.9	11	9.28	10	60.9	25
Apr. 10.0	36.74	1	52.1	21	12.78	1	31.4	13	9.97	2	41.9	10	9.28	0	58.4	25
20.0	36.79	5	49.7	24	12.84	6	29.8	16	10.05	8	41.1	8	9.37	9	56.0	24
30.0	36.89	10	47.1	26	12.94	10	28.0	18	10.17	12	40.5	6	9.56	19	53.7	23
May 9.9	37.04	15	44.5	26	13.08	14	26.0	20	10.34	17	40.2	3	9.83	27	51.7	20
19.9	37.23	19	41.7	28	13.27	19	23.9	21	10.56	22	40.3	1	10.19	36	50.1	16
29.9	37.46	23	38.9	28	13.49	22	21.7	22	10.83	27	40.6	3	10.63	44	48.8	13
June 8.9	37.73	27	36.2	27	13.75	26	19.4	23	11.12	29	41.2	6	11.13	50	48.0	8
18.8	38.03	30	33.6	26	14.03	28	17.1	23	11.45	33	42.1	9	11.68	55	47.7	3
28.8	38.34	31	31.2	24	14.34	31	14.8	23	11.80	35	43.3	12	12.26	58	47.8	1
July 8.8	38.68	34	29.0	22	14.65	31	12.7	21	12.15	35	44.8	15	12.87	61	48.3	5
18.8	39.01	33	27.1	19	14.97	32	10.8	19	12.51	36	46.5	17	13.48	61	49.4	11
28.7	39.34	33	25.6	15	15.29	32	9.0	18	12.87	36	48.3	18	14.08	60	50.9	15
Aug. 7.7	39.66	32	24.5	11	15.60	31	7.5	15	13.21	34	50.2	19	14.66	58	52.7	18
17.7	39.96	30	23.7	8	15.89	29	6.4	11	13.53	32	52.3	21	15.20	54	55.0	23
27.6	40.24	28	23.4	3	16.15	26	5.5	9	13.82	29	54.3	20	15.71	51	57.5	25
Sept. 6.6	40.49	25	23.6	2	16.39	24	5.0	5	14.09	27	56.3	20	16.17	46	60.3	28
16.6	40.70	21	24.1	5	16.60	21	4.9	1	14.32	23	58.3	20	16.57	40	63.2	29
26.6	40.88	18	25.0	9	16.77	17	5.0	1	14.52	20	60.2	19	16.91	34	66.4	32
Oct. 6.5	41.01	13	26.3	13	16.91	14	5.5	5	14.69	17	62.0	18	17.19	28	69.6	32
16.5	41.11	10	27.8	15	17.02	11	6.2	7	14.82	13	63.6	16	17.40	21	72.8	32
26.5	41.18	7	29.5	17	17.10	8	7.1	9	14.92	10	65.1	15	17.54	14	76.0	32
Nov. 5.5	41.20	2	31.4	19	17.14	4	8.2	11	14.99	7	66.4	13	17.61	7	79.0	30
15.4	41.20	0	33.3	19	17.15	1	9.4	12	15.02	3	67.5	11	17.61	0	81.9	29
25.4	41.16	4	35.1	18	17.14	1	10.6	12	15.02	0	68.4	9	17.54	7	84.5	26
Dec. 5.4	41.10	6	36.8	17	17.11	3	11.9	13	14.99	3	69.1	7	17.41	13	86.8	23
15.3	41.01	9	38.3	15	17.05	6	13.0	11	14.93	6	69.5	4	17.21	20	88.7	19
25.3	40.90	11	39.5	12	16.96	9	14.0	10	14.84	9	69.7	2	16.95	26	90.2	15
35.3	40.78	12	40.5	10	16.86	10	14.9	9	14.73	11	69.6	1	16.65	30	91.1	9
Sec δ, Tan δ	1.108		−0.477		1.018		−0.190		1.145		+0.558		2.222		+1.984	
Mean Place	36ˢ.877		54″.98		12ˢ.903		34″.01		10ˢ.505		37″.26		11ˢ.632		49″.70	
D′ψα, Dωα	−0.01		+0.03		0.00		+0.01		+0.01		−0.03		+0.02		−0.12	
Dψδ, Dωδ	+0.4		+0.4		+0.4		+0.5		+0.4		+0.5		+0.4		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ξ Piscium.** Mag. 4.8				**β Arietis.** Mag. 2.7				**ψ Phœnicis.** Mag. 4.4				**υ Ceti.** Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decl tion	
	h m		° ′		h m		° ′		h m		° ′		h m			
	1 49		+ 2 45		1 49		+20 23		1 50		−46 42		1 55		−21	
	s		″		s		″		s		″		s		″	
Jan. 0.3	6.75		53.0		53.66		27.7		13.13		95.7		58.05		41.	
10.3	6.65	10	52.4	6	53.55	11	27.3	4	12.91	22	96.4	7	57.93	12	42.	
20.2	6.54	11	51.8	6	53.43	12	26.8	5	12.68	23	96.6	2	57.79	14	43.	
30.2	6.42	12	51.2	6	53.30	13	26.2	6	12.44	24	96.3	3	57.65	14	43.3	
Feb. 9.2	6.30	12	50.8	4	53.16	14	25.4	8	12.21	23	95.5	8	57.50	15	43.	
19.2	6.18	12	50.5	3	53.03	13	24.6	8	11.99	22	94.2	13	57.36	14	42.8	
Mar. 1.1	6.07	11	50.3	2	52.92	11	23.8	8	11.80	19	92.5	17	57.24	12	42.0	
11.1	5.99	8	50.2	1	52.83	9	23.0	8	11.63	17	90.4	21	57.13	11	41.0	
21.1	5.93	6	50.3	1	52.77	6	22.2	8	11.50	13	87.9	25	57.05	8	39.6	
31.1	5.91	2	50.7	4	52.75	2	21.5	7	11.42	8	85.0	29	57.01	4	37.9	
Apr. 10.0	5.93	2	51.2	5	52.77	2	21.0	5	11.39	3	82.0	30	57.01	0	36.0	
20.0	5.99	6	52.0	8	52.83	6	20.8	2	11.41	2	78.7	33	57.05	4	33.9	
30.0	6.09	10	53.0	10	52.95	12	20.7	1	11.49	8	75.4	33	57.14	9	31.5	
May 9.9	6.24	15	54.3	13	53.11	16	20.9	2	11.63	14	72.0	34	57.27	13	29.0	
19.9	6.43	19	55.7	14	53.31	20	21.4	5	11.82	19	68.6	34	57.44	17	26.4	
29.9	6.66	23	57.3	16	53.56	25	22.2	8	12.07	25	65.3	33	57.66	22	23.8	
June 8.9	6.92	26	59.1	18	53.84	28	23.2	10	12.36	29	62.1	32	57.92	26	21.2	
18.8	7.21	29	61.0	19	54.15	31	24.4	12	12.69	33	59.2	29	58.20	28	18.6	
28.8	7.52	31	63.0	20	54.47	32	25.9	15	13.06	37	56.7	25	58.51	31	16.2	
July 8.8	7.84	32	64.9	19	54.81	34	27.5	16	13.45	39	54.5	22	58.83	32	13.9	
18.8	8.16	32	66.9	20	55.15	34	29.3	18	13.84	39	52.8	17	59.16	33	12.0	
28.7	8.47	31	68.7	18	55.48	33	31.2	19	14.24	40	51.6	12	59.48	32	10.3	
Aug. 7.7	8.78	31	70.4	17	55.81	33	33.1	19	14.63	39	50.9	7	59.80	32	9.0	
17.7	9.07	29	71.9	15	56.11	30	34.9	18	15.00	37	50.7	2	60.10	30	8.1	
27.6	9.33	26	73.2	13	56.39	28	36.7	18	15.34	34	51.1	4	60.38	28	7.6	
Sept. 6.6	9.57	24	74.3	11	56.65	26	38.5	18	15.65	31	52.0	9	60.63	25	7.5	
16.6	9.78	21	75.1	8	56.87	22	40.1	16	15.91	26	53.4	14	60.85	22	7.9	4
26.6	9.96	18	75.7	6	57.06	19	41.6	15	16.12	21	55.2	18	61.04	19	8.6	7
Oct. 6.5	10.10	14	76.0	3	57.22	16	42.9	13	16.28	16	57.4	22	61.19	15	9.6	10
16.5	10.22	12	76.1	1	57.35	13	44.0	11	16.39	11	59.8	24	61.30	11	10.9	13
26.5	10.30	8	75.9	2	57.44	9	45.0	10	16.45	6	62.4	26	61.38	8	12.4	15
Nov. 5.5	10.36	6	75.6	3	57.50	6	45.7	7	16.46	1	65.1	27	61.43	5	14.1	17
15.4	10.39	3	75.2	4	57.54	4	46.3	6	16.42	4	67.8	27	61.44	1	15.9	18
25.4	10.38	1	74.6	6	57.54	0	46.7	4	16.33	9	70.3	25	61.42	2	17.6	17
Dec. 5.4	10.36	2	74.0	6	57.52	2	46.9	2	16.20	13	72.5	22	61.38	4	19.3	17
15.3	10.31	5	73.3	7	57.47	5	47.0	1	16.04	16	74.4	19	61.31	7	20.8	15
25.3	10.24	7	72.6	7	57.39	8	46.9	1	15.85	19	75.9	15	61.21	10	22.1	13
35.3	10.15	9	72.0	6	57.30	9	46.6	3	15.64	21	77.0	11	61.10	11	23.2	11
Sec δ, Tan δ	1.001		+0.048		1.067		+0.372		1.459		−1.062		1.075		−0.394	
Mean Place	$6^{s}.111$		$48''.25$		$53^{s}.132$		$17''.03$		$11^{s}.790$		$85''.86$		$57^{s}.141$		$38''.70$	
D′ψ α, Dω α	0.00		0.00		0.00		−0.02		−0.01		+0.06		−0.01		+0.02	
Dψ δ, Dω δ	+0.4		+0.5		+0.4		+0.5		+0.4		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**α Hydri.** Mag. 3.0				**50 Cassiopeiæ.** Mag. 4.1				**γ Andromedæ *pr*.** Mag. 2.3				**α Arietis.** Mag. 2.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 56		−61 58		1 55		+72 0		1 58		+41 55		2 2		+23 3	
	s		″		s		″		s		″		s		″	
Jan. 0.3	5.25		89.2		64.22		44.1		37.34		20.6		19.89		34.4	
10.3	4.87	38	89.8	6	63.70	52	45.1	10	37.18	16	20.8	2	19.79	10	34.1	3
20.3	4.48	39	89.8	0	63.13	57	45.5	4	37.01	17	20.6	2	19.66	13	33.7	4
30.2	4.08	40	89.3	5	62.54	59	45.3	2	36.82	19	20.1	5	19.53	13	33.1	6
Feb. 9.2	3.69	39	88.2	11	61.96	58	44.6	7	36.63	19	19.2	9	19.39	14	32.4	7
19.2	3.32	37	86.5	17	61.41	55	43.3	13	36.44	19	18.1	11	19.25	14	31.6	8
Mar. 1.1	2.99	33	84.4	21	60.91	50	41.5	18	36.27	17	16.7	14	19.12	13	30.7	9
11.1	2.70	29	81.8	26	60.50	41	39.4	21	36.14	13	15.1	16	19.02	10	29.8	9
21.1	2.47	23	78.8	30	60.19	31	36.9	25	36.04	10	13.5	16	18.95	7	29.0	8
31.1	2.30	17	75.6	32	60.00	19	34.2	27	35.99	5	11.8	17	18.91	4	28.2	8
Apr. 10.0	2.20	10	72.1	35	59.94	6	31.5	27	36.00	1	10.2	16	18.92	1	27.6	6
20.0	2.18	2	68.5	36	60.02	8	28.8	27	36.06	6	8.7	15	18.97	5	27.1	5
30.0	2.24	6	64.7	38	60.23	21	26.2	26	36.19	13	7.4	13	19.08	11	26.9	2
May 10.0	2.37	13	61.0	37	60.58	35	23.9	23	36.37	18	6.3	11	19.23	15	26.9	0
19.9	2.59	22	57.4	36	61.04	46	21.8	21	36.61	24	5.6	7	19.43	20	27.1	2
29.9	2.88	29	53.9	35	61.62	58	20.2	16	36.89	28	5.2	4	19.67	24	27.7	6
June 8.9	3.24	36	50.7	32	62.29	67	18.9	13	37.22	33	5.2	0	19.95	28	28.5	8
18.8	3.65	41	47.8	29	63.04	75	18.2	7	37.59	37	5.5	3	20.25	30	29.6	11
28.8	4.12	47	45.2	26	63.83	79	17.9	3	37.97	38	6.2	7	20.58	33	30.9	13
July 8.8	4.62	50	43.1	21	64.66	83	18.2	3	38.37	40	7.3	11	20.92	34	32.4	15
18.8	5.14	52	41.6	15	65.50	84	18.9	7	38.78	41	8.6	13	21.27	35	34.1	17
28.7	5.67	53	40.6	10	66.34	84	20.1	12	39.19	41	10.3	17	21.61	34	35.8	17
Aug. 7.7	6.19	52	40.1	5	67.15	81	21.8	17	39.58	39	12.1	18	21.94	33	37.6	18
17.7	6.69	50	40.3	2	67.92	77	23.9	21	39.95	37	14.2	21	22.25	31	39.5	19
27.7	7.16	47	41.1	8	68.64	72	26.3	24	40.29	34	16.4	22	22.55	30	41.3	18
Sept. 6.6	7.57	41	42.4	13	69.30	66	29.1	28	40.61	32	18.7	23	22.81	26	43.1	18
16.6	7.93	36	44.2	18	69.87	57	32.1	30	40.88	27	21.1	24	23.05	24	44.7	16
26.6	8.22	29	46.5	23	70.37	50	35.3	32	41.12	24	23.5	24	23.26	21	46.3	16
Oct. 6.5	8.43	21	49.1	26	70.77	40	38.7	34	41.33	21	25.8	23	23.43	17	47.7	14
16.5	8.56	13	52.0	29	71.08	31	42.2	35	41.49	16	28.1	23	23.58	15	48.9	12
26.5	8.61	5	55.0	30	71.28	20	45.6	34	41.62	13	30.3	22	23.69	11	50.0	11
Nov. 5.5	8.59	2	58.1	31	71.38	10	49.0	34	41.70	8	32.3	20	23.77	8	50.9	9
15.4	8.49	10	61.0	29	71.37	1	52.2	32	41.74	4	34.1	18	23.81	4	51.7	8
25.4	8.31	18	63.8	28	71.25	12	55.2	30	41.74	0	35.7	16	23.83	2	52.2	5
Dec. 5.4	8.07	24	66.2	24	71.03	22	57.9	27	41.71	3	37.1	14	23.81	2	52.6	4
15.4	7.78	29	68.2	20	70.71	32	60.2	23	41.64	7	38.2	11	23.77	4	52.8	2
25.3	7.44	34	69.7	15	70.31	40	62.1	19	41.53	11	38.9	7	23.70	7	52.8	0
35.3	7.07	37	70.7	10	69.83	48	63.4	13	41.39	14	39.3	4	23.61	9	52.7	1
Sec δ, Tan δ	2.129		−1.879		3.238		+3.080		1.344		+0.898		1.087		+0.426	
Mean Place	$3^{s}.199$		$77''.05$		$63^{s}.841$		$20''.87$		$36^{s}.849$		$3''.36$		$19^{s}.300$		$22''.66$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.02		+0.11		+0.04		−0.18		+0.01		−0.05		+0.01		−0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**β Trianguli.** Mag. 3.1				**55 Cassiopeiæ.** Mag. 6.2				**6 Persei.** Mag. 5.4				**ξ^1 Ceti.** Mag. 4.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 2 4		° ′ +34 34		h m 2 7		° ′ +66 7		h m 2 7		° ′ +50 40		h m 2 8		° ′ + 8 26	
	s		″		s		″		s		″		s		″	
Jan. 0.3	25.84		66.9		43.53		41.6		53.19		20.2		27.09		44.4	
10.3	25.71	13	66.9	0	43.17	36	42.6	10	53.00	19	20.7	5	26.99	10	43.8	6
20.3	25.56	15	66.7	2	42.77	40	43.0	4	52.78	22	20.8	1	26.88	11	43.2	6
30.2	25.40	16	66.2	5	42.35	42	42.9	1	52.55	23	20.4	4	26.76	12	42.7	5
Feb. 9.2	25.23	17	65.4	8	41.92	43	42.3	6	52.30	25	19.7	7	26.63	13	42.2	5
19.2	25.07	16	64.4	10	41.51	41	41.1	12	52.07	23	18.5	12	26.50	13	41.7	5
Mar. 1.1	24.92	15	63.2	12	41.13	38	39.5	16	51.86	21	17.0	15	26.38	12	41.3	4
11.1	24.80	12	61.9	13	40.81	32	37.5	20	51.68	18	15.3	17	26.29	9	41.0	3
21.1	24.71	9	60.5	14	40.57	24	35.2	23	51.54	14	13.4	19	26.22	7	40.9	1
31.1	24.67	4	59.2	13	40.42	15	32.7	25	51.46	8	11.4	20	26.18	4	40.9	0
Apr. 10.0	24.67	0	57.9	13	40.36	6	30.1	26	51.45	1	9.4	20	26.18	0	41.1	2
20.0	24.73	6	56.8	11	40.41	5	27.6	25	51.50	5	7.5	19	26.22	4	41.5	4
30.0	24.84	11	55.9	9	40.57	16	25.2	24	51.63	13	5.7	18	26.31	9	42.1	6
May 10.0	25.00	16	55.3	6	40.83	26	23.0	22	51.82	19	4.2	15	26.44	13	43.0	9
19.9	25.22	22	54.9	4	41.18	35	21.1	19	52.08	26	3.0	12	26.62	18	44.1	11
29.9	25.48	26	54.9	0	41.63	45	19.6	15	52.39	31	2.1	9	26.84	22	45.4	13
June 8.9	25.78	30	55.1	2	42.15	52	18.4	12	52.76	37	1.6	5	27.09	25	46.8	14
18.8	26.11	33	55.7	6	42.73	58	17.7	7	53.17	41	1.5	1	27.37	28	48.5	17
28.8	26.47	36	56.6	9	43.35	62	17.5	2	53.60	43	1.8	3	27.67	30	50.2	17
July 8.8	26.84	37	57.8	12	44.01	66	17.8	3	54.06	46	2.5	7	27.99	32	52.0	18
18.8	27.22	38	59.2	14	44.68	67	18.5	7	54.52	46	3.5	10	28.31	32	53.8	18
28.7	27.59	37	60.9	17	45.34	66	19.7	12	54.98	46	4.9	14	28.64	33	55.6	18
Aug. 7.7	27.95	36	62.7	18	45.99	65	21.2	15	55.43	45	6.7	18	28.95	31	57.4	18
17.7	28.30	35	64.7	20	46.62	63	23.2	20	55.86	43	8.7	20	29.25	30	59.0	16
27.7	28.62	32	66.7	20	47.21	59	25.5	23	56.26	40	10.9	22	29.53	28	60.4	14
Sept. 6.6	28.91	29	68.8	21	47.74	53	28.1	26	56.63	37	13.3	24	29.78	25	61.6	12
16.6	29.17	26	70.9	21	48.22	48	30.9	28	56.96	33	15.8	25	30.01	23	62.7	11
26.6	29.40	23	73.0	21	48.64	42	33.9	30	57.25	29	18.4	26	30.21	20	63.5	8
Oct. 6.5	29.60	20	74.9	19	48.99	35	37.1	32	57.50	25	21.1	27	30.37	16	64.1	6
16.5	29.76	16	76.8	19	49.27	28	40.3	32	57.70	20	23.7	26	30.51	14	64.5	4
26.5	29.88	12	78.6	18	49.47	20	43.5	32	57.85	15	26.3	26	30.62	11	64.6	1
Nov. 5.5	29.97	9	80.2	16	49.60	13	46.7	32	57.95	10	28.8	25	30.70	8	64.6	0
15.4	30.02	5	81.6	14	49.64	4	49.7	30	58.01	6	31.1	23	30.74	4	64.5	1
25.4	30.04	2	82.8	12	49.60	4	52.5	28	58.01	0	33.2	21	30.76	2	64.2	3
Dec. 5.4	30.02	2	83.8	10	49.49	11	55.1	26	57.97	4	35.0	18	30.75	1	63.8	4
15.4	29.97	5	84.6	8	49.30	19	57.2	21	57.89	8	36.5	15	30.72	3	63.4	4
25.3	29.88	9	85.1	5	49.03	27	59.0	18	57.76	13	37.7	12	30.66	6	62.9	5
35.3	29.77	11	85.3	2	48.70	33	60.3	13	57.59	17	38.4	7	30.57	9	62.3	6
Sec δ, Tan δ	1.215		+0.690		2.471		+2.260		1.578		+1.221		1.011		+0.149	
Mean Place	$25^{s}.281$		51″.64		$42^{s}.944$		19″.26		$52^{s}.635$		0″.76		$26^{s}.379$		37″.21	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.01		−0.04		+0.03		−0.13		+0.02		−0.07		0.00		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Fornacis. Mag. 5.2				γ Trianguli. Mag. 4.1				67 Ceti. Mag. 5.7				φ Eridani. Mag. 3.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 9		−31 7		2 12		+33 26		2 12		− 6 48		2 13		−51 53	
	s		″		s		″		s		″		s		″	
Jan. 0.3	8.11	15	42.9	10	12.44	12	75.0	0	42.41	10	62.7	8	27.80	26	105.6	10
10.3	7.96	16	43.9	6	12.32	15	75.0	2	42.31	12	63.5	7	27.54	27	106.6	4
20.3	7.80	17	44.5	2	12.17	16	74.8	5	42.19	13	64.2	5	27.27	29	107.0	1
30.2	7.63	17	44.7	2	12.01	16	74.3	7	42.06	13	64.7	3	26.98	28	106.9	7
Feb. 9.2	7.46	17	44.5	7	11.85	16	73.6	9	41.93	13	65.0	1	26.70	27	106.2	12
19.2	7.29	16	43.8	10	11.69	15	72.7	11	41.80	12	65.1	1	26.43	26	105.0	16
Mar. 1.2	7.13	13	42.8	14	11.54	13	71.6	12	41.68	10	65.0	4	26.17	22	103.4	21
11.1	7.00	11	41.4	17	11.41	9	70.4	13	41.58	8	64.6	6	25.95	19	101.3	25
21.1	6.89	7	39.7	21	11.32	6	69.1	13	41.50	5	64.0	8	25.76	14	98.8	29
31.1	6.82	3	37.6	24	11.26	0	67.8	12	41.45	1	63.2	11	25.62	8	95.9	31
Apr. 10.0	6.79	2	35.2	25	11.26	5	66.6	10	41.44	3	62.1	13	25.54	3	92.8	34
20.0	6.81	6	32.7	28	11.31	10	65.6	9	41.47	8	60.8	15	25.51	4	89.4	35
30.0	6.87	12	29.9	29	11.41	15	64.7	6	41.55	12	59.3	17	25.55	10	85.9	35
May 10.0	6.99	16	27.0	30	11.56	20	64.1	3	41.67	17	57.6	19	25.65	17	82.4	35
19.9	7.15	21	24.0	30	11.76	26	63.8	1	41.84	20	55.7	21	25.82	22	78.9	35
29.9	7.36	25	21.0	29	12.02	29	63.7	3	42.04	24	53.6	21	26.04	28	75.4	33
June 8.9	7.61	28	18.1	28	12.31	32	64.0	6	42.28	27	51.5	21	26.32	33	72.1	30
18.9	7.89	31	15.3	26	12.63	35	64.6	9	42.55	29	49.4	22	26.65	37	69.1	27
28.8	8.20	33	12.7	23	12.98	37	65.5	11	42.84	31	47.2	21	27.02	40	66.4	24
July 8.8	8.53	34	10.4	20	13.35	37	66.6	14	43.15	32	45.1	20	27.42	42	64.0	19
18.8	8.87	34	8.4	16	13.72	37	68.0	16	43.47	31	43.1	17	27.84	42	62.1	13
28.7	9.21	34	6.8	12	14.09	36	69.6	18	43.78	31	41.4	16	28.26	42	60.8	8
Aug. 7.7	9.55	32	5.6	7	14.45	35	71.4	19	44.09	29	39.8	13	28.68	41	60.0	3
17.7	9.87	30	4.9	3	14.80	32	73.3	19	44.38	28	38.5	10	29.09	39	59.7	3
27.7	10.17	27	4.6	3	15.12	30	75.2	20	44.66	25	37.5	7	29.48	35	60.0	9
Sept. 6.6	10.44	24	4.9	7	15.42	26	77.2	20	44.91	23	36.8	3	29.83	31	60.9	14
16.6	10.68	21	5.6	11	15.68	24	79.2	20	45.14	20	36.5	1	30.14	26	62.3	19
26.6	10.89	17	6.7	15	15.92	20	81.2	19	45.34	17	36.4	3	30.40	20	64.2	23
Oct. 6.6	11.06	13	8.2	18	16.12	17	83.1	18	45.51	13	36.7	5	30.60	15	66.5	26
16.5	11.19	9	10.0	20	16.29	13	84.9	17	45.64	10	37.2	7	30.75	9	69.1	28
26.5	11.28	5	12.0	22	16.42	10	86.6	15	45.74	8	37.9	10	30.84	3	71.9	29
Nov. 5.5	11.33	1	14.2	22	16.52	6	88.1	13	45.82	4	38.9	10	30.87	3	74.8	29
15.4	11.34	2	16.4	22	16.58	2	89.4	12	45.86	1	39.9	11	30.84	8	77.7	27
25.4	11.32	6	18.6	20	16.60	1	90.6	9	45.87	1	41.0	12	30.76	13	80.4	25
Dec. 5.4	11.26	8	20.6	18	16.59	4	91.5	7	45.86	4	42.2	11	30.63	18	82.9	22
15.4	11.18	11	22.4	16	16.55	8	92.2	5	45.82	6	43.3	10	30.45	21	85.1	18
25.3	11.07	14	24.0	12	16.47	10	92.7	2	45.76	9	44.3	9	30.24	25	86.9	13
35.3	10.93		25.2		16.37		92.9		45.67		45.2		29.99		88.2	
Sec δ, Tan δ	1.168		−0.604		1.199		+0.661		1.007		−0.119		1.621		−1.276	
Mean Place	$6^{s}.993$		$37''.81$		$11^{s}.815$		$59''.99$		$41^{s}.561$		$65''.03$		$26^{s}.132$		$96''.01$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		+0.03		+0.01		−0.04		0.00		+0.01		−0.02		+0.07	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

84368°—1914——20 [Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ο Ceti.** Var. 1.7–9.6				**κ Fornacis.** Mag. 5.4				**δ Hydri.** Mag. 4.3				**ι Cassiopeiæ.** Mag. 4.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 14		− 3 21		2 18		−24 11		2 20		−69 2		2 21		+67 0	
	s		″		s		″		s		″		s		″	
Jan. 0.3	60.89	10	59.7	7	37.47	12	87.3	10	15.79	54	73.3	8	58.65	36	81.9	12
10.3	60.79	11	60.4	7	37.35	14	88.3	7	15.25	56	74.1	3	58.29	41	83.1	6
20.3	60.68	12	61.1	5	37.21	16	89.0	4	14.69	58	74.4	4	57.88	44	83.7	1
30.2	60.56	13	61.6	4	37.05	16	89.4	0	14.11	57	74.0	10	57.44	45	83.8	5
Feb. 9.2	60.43	13	62.0	2	36.89	15	89.4	4	13.54	55	73.0	15	56.99	44	83.3	10
19.2	60.30	12	62.2	0	36.74	15	89.0	7	12.99	51	71.5	20	56.55	41	82.3	14
Mar. 1.2	60.18	11	62.2	2	36.59	13	88.3	11	12.48	46	69.5	25	56.14	35	80.9	19
11.1	60.07	8	62.0	4	36.46	10	87.2	13	12.02	40	67.0	28	55.79	28	79.0	22
21.1	59.99	5	61.6	7	36.36	7	85.9	17	11.62	31	64.2	32	55.51	19	76.8	24
31.1	59.94	1	60.9	9	36.29	3	84.2	20	11.31	23	61.0	35	55.32	10	74.4	25
Apr. 10.0	59.93	3	60.0	11	36.26	1	82.2	22	11.08	13	57.5	37	55.22	2	71.9	26
20.0	59.96	8	58.9	13	36.27	6	80.0	25	10.95	3	53.8	37	55.24	13	69.3	25
30.0	60.04	12	57.6	15	36.33	11	77.5	26	10.92	8	50.1	38	55.37	23	66.8	23
May 10.0	60.16	17	56.1	17	36.44	16	74.9	27	11.00	18	46.3	37	55.60	34	64.5	20
19.9	60.33	20	54.4	19	36.60	19	72.2	27	11.18	27	42.6	36	55.94	43	62.5	17
29.9	60.53	24	52.5	19	36.79	24	69.5	27	11.45	37	39.0	33	56.37	52	60.8	13
June 8.9	60.77	27	50.6	21	37.03	27	66.8	27	11.82	46	35.7	31	56.89	58	59.5	9
18.9	61.04	29	48.5	21	37.30	29	64.1	25	12.28	53	32.6	27	57.47	63	58.6	4
28.8	61.33	31	46.4	20	37.59	32	61.6	24	12.81	58	29.9	22	58.10	67	58.2	0
July 8.8	61.64	32	44.4	19	37.91	33	59.2	20	13.39	63	27.7	17	58.77	69	58.2	5
18.8	61.96	31	42.5	18	38.24	33	57.2	17	14.02	65	26.0	11	59.46	69	58.7	10
28.7	62.27	31	40.7	16	38.57	32	55.5	14	14.67	65	24.9	6	60.15	69	59.7	13
Aug. 7.7	62.58	29	39.1	14	38.89	31	54.1	9	15.32	64	24.3	0	60.84	66	61.0	18
17.7	62.87	28	37.7	11	39.20	29	53.2	5	15.96	60	24.3	7	61.50	63	62.8	21
27.7	63.15	26	36.6	8	39.49	27	52.7	1	16.56	56	25.0	12	62.13	57	64.9	25
Sept. 6.6	63.41	22	35.8	5	39.76	24	52.6	4	17.12	49	26.2	18	62.70	53	67.4	27
16.6	63.63	20	35.3	2	40.00	21	53.0	7	17.61	40	28.0	22	63.23	47	70.1	29
26.6	63.83	17	35.1	1	40.21	17	53.7	12	18.01	31	30.2	27	63.70	40	73.0	31
Oct. 6.6	64.00	14	35.2	3	40.38	14	54.9	15	18.32	21	32.9	30	64.10	32	76.1	31
16.5	64.14	11	35.5	6	40.52	11	56.4	17	18.53	10	35.9	31	64.42	25	79.2	32
26.5	64.25	7	36.1	7	40.63	6	58.1	19	18.63	1	39.0	32	64.67	17	82.4	32
Nov. 5.5	64.32	5	36.8	9	40.69	4	60.0	19	18.62	11	42.2	32	64.84	8	85.6	31
15.4	64.37	2	37.7	9	40.73	0	61.9	20	18.51	22	45.4	29	64.92	1	88.7	28
25.4	64.39	1	38.6	10	40.73	3	63.9	19	18.29	31	48.3	27	64.91	8	91.5	27
Dec. 5.4	64.38	4	39.6	10	40.70	6	65.8	17	17.98	39	51.0	22	64.83	18	94.2	23
15.4	64.34	6	40.6	9	40.64	9	67.5	15	17.59	46	53.2	18	64.65	25	96.5	19
25.3	64.28	8	41.5	9	40.55	12	69.0	12	17.13	52	55.0	12	64.40	32	98.4	14
35.3	64.20		42.4		40.43		70.2		16.61		56.2		64.08		99.8	
Sec δ, Tan δ	1.002		−0.059		1.096		−0.449		2.796		−2.612		2.562		+2.358	
Mean Place	$60^{s}.063$		$63''.13$		$36^{s}.412$		$84''.53$		$12^{s}.842$		$61''.77$		$57^{s}.798$		$59''.52$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		0.00		−0.01		+0.02		−0.04		+0.14		+0.04		−0.13	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ξ^2 Ceti. Mag. 4.3				σ Ceti. Mag. 4.8				36 H. Cassiopeiæ. Mag. 5.3				ν Ceti. Mag. 5.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 23		+ 8 4		2 28		−15 36		2 29		+72 26		2 31		+ 5 13	
	s		″		s		″		s		″		s		″	
Jan. 0.3	35.86		37.8		1.60		77.1		50.88		58.0		22.39		13.5	
		9		5		11		10		48		14		9		6
10.3	35.77		37.3		1.49		78.1		50.40		59.4		22.30		12.9	
		11		6		12		7		55		8		11		6
20.3	35.66		36.7		1.37		78.8		49.85		60.2		22.19		12.3	
		13		5		14		5		60		3		12		5
30.2	35.53		36.2		1.23		79.3		49.25		60.5		22.07		11.8	
		13		5		15		2		61		3		13		5
Feb. 9.2	35.40		35.7		1.08		79.5		48.64		60.2		21.94		11.3	
		13		4		14		1		59		9		14		4
19.2	35.27		35.3		0.94		79.4		48.05		59.3		21.80		10.9	
		13		4		14		3		56		14		13		2
Mar. 1.2	35.14		34.9		0.80		79.1		47.49		57.9		21.67		10.7	
		11		3		13		7		50		18		11		2
11.1	35.03		34.6		0.67		78.4		46.99		56.1		21.56		10.5	
		8		1		10		10		40		22		9		0
21.1	34.95		34.5		0.57		77.4		46.59		53.9		21.47		10.5	
		5		0		6		12		28		25		6		2
31.1	34.90		34.5		0.51		76.2		46.31		51.4		21.41		10.7	
		2		2		4		15		16		26		2		4
Apr. 10.1	34.88		34.7		0.47		74.7		46.15		48.8		21.39		11.1	
		3		4		1		18		2		27		2		5
20.0	34.91		35.1		0.48		72.9		46.13		46.1		21.41		11.6	
		8		7		6		19		12		27		6		8
30.0	34.99		35.8		0.54		71.0		46.25		43.4		21.47		12.4	
		12		8		10		22		26		25		11		10
May 10.0	35.11		36.6		0.64		68.8		46.51		40.9		21.58		13.4	
		16		11		15		23		39		23		16		12
19.9	35.27		37.7		0.79		66.5		46.90		38.6		21.74		14.6	
		21		12		19		24		51		19		19		14
29.9	35.48		38.9		0.98		64.1		47.41		36.7		21.93		16.0	
		24		15		22		25		62		16		24		15
June 8.9	35.72		40.4		1.20		61.6		48.03		35.1		22.17		17.5	
		27		16		26		24		71		12		26		17
18.9	35.99		42.0		1.46		59.2		48.74		33.9		22.43		19.2	
		30		17		28		24		78		7		29		18
28.8	36.29		43.7		1.74		56.8		49.52		33.2		22.72		21.0	
		31		18		31		22		83		2		31		18
July 8.8	36.60		45.5		2.05		54.6		50.35		33.0		23.03		22.8	
		32		17		32		21		86		3		32		18
18.8	36.92		47.2		2.37		52.5		51.21		33.3		23.35		24.6	
		32		18		31		18		87		7		31		17
28.8	37.24		49.0		2.68		50.7		52.08		34.0		23.66		26.3	
		31		17		32		15		87		12		32		17
Aug. 7.7	37.55		50.7		3.00		49.2		52.95		35.2		23.98		28.0	
		31		15		30		11		84		16		30		15
17.7	37.86		52.2		3.30		48.1		53.79		36.8		24.28		29.5	
		28		14		29		8		80		20		29		13
27.7	38.14		53.6		3.59		47.3		54.59		38.8		24.57		30.8	
		27		12		26		4		75		23		26		11
Sept. 6.6	38.41		54.8		3.85		46.9		55.34		41.1		24.83		31.9	
		24		10		24		0		69		27		24		8
16.6	38.65		55.8		4.09		46.9		56.03		43.8		25.07		32.7	
		21		7		21		4		61		29		22		6
26.6	38.86		56.5		4.30		47.3		56.64		46.7		25.29		33.3	
		18		6		18		7		52		31		19		4
Oct. 6.6	39.04		57.1		4.48		48.0		57.16		49.8		25.48		33.7	
		15		3		15		10		43		33		15		1
16.5	39.19		57.4		4.63		49.0		57.59		53.1		25.63		33.8	
		12		1		11		13		33		33		13		0
26.5	39.31		57.5		4.74		50.3		57.92		56.4		25.76		33.8	
		10		0		9		15		22		34		10		3
Nov. 5.5	39.41		57.5		4.83		51.8		58.14		59.8		25.86		33.5	
		6		2		5		15		11		32		7		4
15.5	39.47		57.3		4.88		53.3		58.25		63.0		25.93		33.1	
		3		4		2		17		0		31		4		5
25.4	39.50		56.9		4.90		55.0		58.25		66.1		25.97		32.6	
		1		4		1		16		13		29		1		6
Dec. 5.4	39.51		56.5		4.89		56.6		58.12		69.0		25.98		32.0	
		3		5		4		15		23		26		2		6
15.4	39.48		56.0		4.85		58.1		57.89		71.6		25.96		31.4	
		5		5		7		13		34		21		5		7
25.3	39.43		55.5		4.78		59.4		57.55		73.7		25.91		30.7	
		8		6		10		12		43		18		7		6
35.3	39.35		54.9		4.68		60.6		57.12		75.5		25.84		30.1	
Sec δ, Tan δ	1.010		+0.142		1.038		−0.280		3.316		+3.162		1.004		+0.091	
Mean Place	$35^{s}.058$		$30''.51$		$0^{s}.592$		$77''.16$		$49^{s}.710$		$34''.93$		$21^{s}.531$		$6''.93$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.01		0.00		+0.01		+0.05		−0.17		0.00		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Hydri. Mag. 5.3				ν Arietis. Mag. 5.4				δ Ceti. Mag. 4.0				ε Hydri. Mag. 4.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 33		−79 28		2 33		+21 35		2 35		− 0 2		2 38		−68 37	
	s		″		s		″		s		″		s		″	
Jan. 0.3	33.69		76.5		56.61		36.0		5.30		25.6		18.80		77.5	
10.3	32.53	116	77.3	8	56.51	10	35.8	2	5.21	9	26.3	7	18.28	52	78.6	11
20.3	31.31	122	77.6	3	56.40	11	35.5	3	5.10	11	27.0	7	17.73	55	79.1	5
30.2	30.06	125	77.2	4	56.26	14	35.0	5	4.98	12	27.5	5	17.15	58	79.0	1
Feb. 9.2	28.82	124	76.2	10	56.12	14	34.5	5	4.84	14	27.9	4	16.57	58	78.3	7
19.2	27.62	120	74.7	15	55.97	15	33.8	7	4.71	13	28.2	3	16.01	56	77.1	12
Mar. 1.2	26.49	113	72.7	20	55.83	14	33.1	7	4.58	13	28.4	2	15.48	53	75.3	18
11.1	25.46	103	70.2	25	55.71	12	32.4	7	4.46	12	28.3	1	14.99	49	73.1	22
21.1	24.56	90	67.3	29	55.61	10	31.7	7	4.37	9	28.1	2	14.57	42	70.4	27
31.1	23.81	75	64.1	32	55.54	7	31.0	7	4.30	7	27.6	5	14.21	36	67.3	31
Apr. 10.1	23.22	59	60.6	35	55.52	2	30.5	5	4.28	2	27.0	6	13.94	27	64.0	33
20.0	22.81	41	57.0	36	55.54	2	30.1	4	4.29	1	26.1	9	13.76	18	60.4	36
30.0	22.59	22	53.2	38	55.61	7	29.9	2	4.34	5	25.0	11	13.69	7	56.7	37
May 10.0	22.56	3	49.5	37	55.73	12	29.9	0	4.45	11	23.7	13	13.71	2	53.0	37
19.9	22.73	17	45.8	37	55.90	17	30.1	2	4.60	15	22.3	14	13.84	13	49.3	37
29.9	23.09	36	42.2	36	56.11	21	30.6	5	4.79	19	20.6	17	14.07	23	45.6	37
June 8.9	23.64	55	38.9	33	56.36	25	31.4	8	5.01	22	18.8	18	14.39	32	42.2	34
18.9	24.36	72	35.9	30	56.65	29	32.3	9	5.27	26	16.9	19	14.80	41	39.0	32
28.8	25.22	86	33.3	26	56.96	31	33.5	12	5.55	28	15.0	19	15.29	49	36.2	28
July 8.8	26.21	99	31.1	22	57.29	33	34.8	13	5.86	31	13.1	19	15.84	55	33.8	24
18.8	27.30	109	29.4	17	57.62	33	36.3	15	6.17	31	11.2	19	16.43	59	31.9	19
28.8	28.45	115	28.3	11	57.96	34	37.9	16	6.48	31	9.4	18	17.06	63	30.5	14
Aug. 7.7	29.63	118	27.8	5	58.30	34	39.5	16	6.80	32	7.8	16	17.70	64	29.7	8
17.7	30.81	118	27.9	1	58.62	32	41.2	17	7.10	30	6.4	14	18.33	63	29.5	2
27.7	31.94	113	28.6	7	58.93	31	42.8	16	7.38	28	5.2	12	18.94	61	30.0	5
Sept. 6.6	32.98	104	29.8	12	59.21	28	44.3	15	7.65	27	4.3	9	19.51	57	31.0	10
16.6	33.91	93	31.6	18	59.47	26	45.8	15	7.89	24	3.7	6	20.02	51	32.6	16
26.6	34.68	77	33.9	23	59.71	24	47.1	13	8.11	22	3.3	4	20.46	44	34.7	21
Oct. 6.6	35.28	60	36.6	27	59.91	20	48.3	12	8.30	19	3.2	1	20.80	34	37.3	26
16.5	35.68	40	39.6	30	60.09	18	49.4	11	8.45	15	3.4	2	21.05	25	40.2	29
26.5	35.87	19	42.8	32	60.23	14	50.3	9	8.58	13	3.8	4	21.20	15	43.3	31
Nov. 5.5	35.83	4	46.1	33	60.34	11	51.0	7	8.68	10	4.4	6	21.24	4	46.5	32
15.5	35.57	26	49.3	32	60.43	9	51.6	6	8.75	7	5.1	7	21.17	7	49.8	33
25.4	35.09	48	52.3	30	60.48	5	52.1	5	8.79	4	5.9	8	21.00	17	52.9	31
Dec. 5.4	34.41	68	54.9	26	60.49	1	52.4	3	8.80	1	6.7	8	20.74	26	55.7	28
15.4	33.56	85	57.2	23	60.48	1	52.6	2	8.78	2	7.6	9	20.39	35	58.1	24
25.3	32.57	99	59.0	18	60.43	5	52.6	0	8.73	5	8.5	9	19.96	43	60.1	20
35.3	31.46	111	60.2	12	60.35	8	52.5	1	8.66	7	9.3	8	19.47	49	61.6	15
Sec δ, Tan δ	5.478		−5.386		1.075		+0.396		1.000		−0.001		2.745		−2.556	
Mean Place	27ˢ.769		65″.15		55ˢ.801		24″.29		4ˢ.388		30″.64		15ˢ.720		67″.12	
D′ψ a, Dω a	−0.09		+0.28		+0.01		−0.02		0.00		0.00		−0.04		+0.13	
Dψ δ, Dω δ	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Persei. Mag. 4.2				γ Ceti *seq.* Mag. 3.7				π Ceti. Mag. 4.4				μ Ceti. Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 38		+48 51		2 38		+ 2 52		2 40		−14 12		2 40		+ 9 45	
	s		″		s		″		s		″		s		″	
Jan. 0.3	19.97		74.6		51.47		32.2		2.76		79.6		18.32		14.3	
10.3	19.82	15	75.3	7	51.38	9	31.5	7	2.66	10	80.6	10	18.23	9	13.8	5
20.3	19.62	20	75.6	3	51.28	10	30.9	6	2.54	12	81.4	8	18.13	10	13.3	5
30.3	19.40	22	75.6	0	51.15	13	30.3	6	2.40	14	82.0	6	18.01	12	12.8	5
Feb. 9.2	19.17	23	75.1	5	51.02	13	29.9	4	2.25	15	82.3	3	17.87	14	12.3	5
19.2	18.94	23	74.3	8	50.88	14	29.5	4	2.10	15	82.3	0	17.73	14	11.8	5
Mar. 1.2	18.71	23	73.1	12	50.75	13	29.3	2	1.96	14	82.0	3	17.60	13	11.4	4
11.1	18.52	19	71.7	14	50.63	12	29.3	0	1.83	13	81.4	6	17.48	12	11.1	3
21.1	18.36	16	70.0	17	50.53	10	29.4	1	1.72	11	80.6	8	17.38	10	10.9	2
31.1	18.25	11	68.2	18	50.47	6	29.6	2	1.65	7	79.4	12	17.32	6	10.9	0
Apr. 10.1	18.19	6	66.4	18	50.44	3	30.1	5	1.61	4	78.0	14	17.29	3	11.0	1
20.0	18.20	1	64.5	19	50.45	1	30.8	7	1.60	1	76.4	16	17.30	1	11.3	3
30.0	18.29	9	62.8	17	50.50	5	31.7	9	1.65	5	74.6	18	17.36	6	11.8	5
May 10.0	18.43	14	61.3	15	50.61	11	32.8	11	1.74	9	72.5	21	17.47	11	12.5	7
20.0	18.64	21	60.0	13	50.75	14	34.1	13	1.87	13	70.3	22	17.62	15	13.4	9
29.9	18.92	28	59.0	10	50.94	19	35.6	15	2.05	18	67.9	24	17.81	19	14.5	11
June 8.9	19.24	32	58.3	7	51.17	23	37.3	17	2.27	22	65.5	24	18.04	23	15.8	13
18.9	19.61	37	58.0	3	51.42	25	39.0	17	2.52	25	63.1	24	18.31	27	17.3	15
28.8	20.02	41	58.1	1	51.71	29	40.8	18	2.80	28	60.8	23	18.60	29	18.9	16
July 8.8	20.45	43	58.5	4	52.01	30	42.7	19	3.09	29	58.6	22	18.91	31	20.5	16
18.8	20.90	45	59.2	7	52.32	31	44.5	18	3.40	31	56.5	21	19.23	32	22.2	17
28.8	21.35	45	60.3	11	52.64	32	46.2	17	3.72	32	54.7	18	19.55	32	23.9	17
Aug. 7.7	21.80	45	61.7	14	52.95	31	47.8	16	4.03	31	53.1	16	19.87	32	25.5	16
17.7	22.23	43	63.3	16	53.25	30	49.3	15	4.34	31	51.9	12	20.17	30	27.0	15
27.7	22.64	41	65.2	19	53.54	29	50.5	12	4.63	29	51.1	8	20.47	30	28.4	14
Sept. 6.7	23.03	39	67.3	21	53.81	27	51.5	10	4.90	27	50.6	5	20.74	27	29.6	12
16.6	23.39	36	69.5	22	54.05	24	52.3	8	5.15	25	50.5	1	20.99	25	30.6	10
26.6	23.71	32	71.8	23	54.27	22	52.7	4	5.37	22	50.8	3	21.22	23	31.4	8
Oct. 6.6	24.00	29	74.2	24	54.47	20	53.0	3	5.56	19	51.4	6	21.42	20	31.9	5
16.5	24.24	24	76.6	24	54.63	16	53.0	0	5.72	16	52.4	10	21.59	17	32.3	4
26.5	24.43	19	78.9	23	54.77	14	52.7	3	5.84	12	53.6	12	21.73	14	32.5	2
Nov. 5.5	24.59	16	81.2	23	54.87	10	52.3	4	5.94	10	55.0	14	21.84	11	32.5	0
15.5	24.69	10	83.4	22	54.95	8	51.7	6	6.00	6	56.5	15	21.92	8	32.4	1
25.4	24.75	6	85.5	21	54.99	4	51.1	6	6.03	3	58.1	16	21.97	5	32.1	3
Dec. 5.4	24.76	1	87.3	18	55.00	1	50.4	7	6.03	0	59.7	16	21.99	2	31.8	3
15.4	24.71	5	88.9	16	54.99	1	49.6	8	6.00	3	61.2	15	21.98	1	31.3	5
25.4	24.62	9	90.2	13	54.95	4	48.8	8	5.95	5	62.6	14	21.94	4	30.9	4
35.3	24.49	13	91.1	9	54.87	8	48.1	7	5.86	9	63.8	12	21.88	6	30.4	5
Sec δ, Tan δ	1.520		+1.145		1.001		+0.050		1.032		−0.253		1.015		+0.172	
Mean Place	19ˢ.110		55″.69		50ˢ.559		26″.16		1ˢ.708		80″.52		17ˢ.435		6″.16	
$D'_\psi a$, $D_\omega a$	+0.02		−0.06		0.00		0.00		0.00		+0.01		0.00		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Persei. Mag. 3.9				41 Arietis. Mag. 3.7				β Fornacis. Mag. 4.5				σ Arietis. Mag. 5.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declin tion
	h m 2 44		° ′ +55 32		h m 2 44		° ′ +26 54		h m 2 45		° ′ −32 45		h m 2 46		° +14
	s		″		s		″		s		″		s		″
Jan. 0.3	25.86		42.0		55.92		37.5		30.81		64.0		45.40		51.3
10.3	25.67	19	43.0	10	55.83	9	37.6	1	30.67	14	65.3	13	45.32	8	50.9
20.3	25.43	24	43.6	6	55.71	12	37.4	2	30.50	17	66.2	9	45.22	10	50.5
30.3	25.16	27	43.7	1	55.57	14	37.1	3	30.32	18	66.7	5	45.09	13	50.0
Feb. 9.2	24.88	28	43.4	3	55.42	15	36.6	5	30.13	19	66.7	0	44.95	14	49.5
19.2	24.59	29	42.6	8	55.26	16	35.9	7	29.94	19	66.3	4	44.81	14	49.0
Mar. 1.2	24.32	27	41.5	11	55.11	15	35.1	8	29.75	19	65.6	7	44.67	14	48.5
11.1	24.07	25	40.0	15	54.97	14	34.3	8	29.58	17	64.4	12	44.54	13	48.1
21.1	23.87	20	38.2	18	54.86	11	33.4	9	29.44	14	62.8	16	44.44	10	47.6
31.1	23.72	15	36.2	20	54.78	8	32.5	9	29.33	11	60.8	20	44.37	7	47.3
Apr. 10.1	23.64	8	34.1	21	54.74	4	31.7	8	29.25	8	58.6	22	44.33	4	47.2
20.0	23.64	0	32.0	21	54.75	1	31.0	7	29.22	3	56.1	25	44.34	1	47.2
30.0	23.71	7	30.0	20	54.81	6	30.5	5	29.24	2	53.3	28	44.40	6	47.4
May 10.0	23.86	15	28.1	19	54.93	12	30.1	4	29.31	7	50.4	29	44.50	10	47.8
20.0	24.09	23	26.5	16	55.09	16	30.0	1	29.44	13	47.4	30	44.65	15	48.4
29.9	24.38	29	25.1	14	55.30	21	30.2	2	29.61	17	44.3	31	44.84	19	49.2
June 8.9	24.74	36	24.1	10	55.55	25	30.6	4	29.82	21	41.3	30	45.07	23	50.2
18.9	25.15	41	23.4	7	55.84	29	31.2	6	30.07	25	38.4	29	45.34	27	51.4
28.8	25.60	45	23.1	3	56.16	32	32.1	9	30.36	29	35.6	28	45.63	29	52.8
July 8.8	26.09	49	23.2	1	56.49	33	33.2	11	30.67	31	33.1	25	45.94	31	54.3
18.8	26.59	50	23.7	5	56.84	35	34.5	13	31.00	33	30.9	22	46.26	32	55.8
28.8	27.10	51	24.6	9	57.19	35	35.9	14	31.34	34	29.1	18	46.59	33	57.4
Aug. 7.7	27.61	51	25.8	12	57.54	35	37.4	15	31.68	34	27.7	14	46.91	32	59.0
17.7	28.10	49	27.4	16	57.88	34	39.0	16	32.02	34	26.7	10	47.23	32	60.5
27.7	28.58	48	29.2	18	58.20	32	40.6	16	32.34	32	26.3	4	47.53	30	61.9
Sept. 6.7	29.02	44	31.3	21	58.51	31	42.2	16	32.63	29	26.4	1	47.82	29	63.2
16.6	29.43	41	33.6	23	58.79	28	43.8	16	32.90	27	26.9	5	48.08	26	64.4
26.6	29.81	38	36.0	24	59.04	25	45.3	15	33.14	24	27.9	10	48.31	23	65.4
Oct. 6.6	30.14	33	38.6	26	59.26	22	46.7	14	33.35	21	29.4	15	48.52	21	66.2
16.5	30.42	28	41.2	26	59.46	20	48.0	13	33.52	17	31.3	19	48.70	18	66.8
26.5	30.65	23	43.9	27	59.62	16	49.2	12	33.65	13	33.4	21	48.85	15	67.3
Nov. 5.5	30.83	18	46.5	26	59.75	13	50.2	10	33.74	9	35.7	23	48.97	12	67.6
15.5	30.95	12	49.0	25	59.85	10	51.1	9	33.79	5	38.1	24	49.06	9	67.8
25.4	31.01	6	51.4	24	59.91	6	51.9	8	33.80	1	40.5	24	49.12	6	67.8
Dec. 5.4	31.02	1	53.6	22	59.94	3	52.5	6	33.78	2	42.8	23	49.15	3	67.7
15.4	30.97	5	55.5	19	59.93	1	53.0	5	33.72	6	45.0	22	49.15	0	67.5
25.4	30.86	11	57.1	16	59.89	4	53.3	3	33.62	10	46.9	19	49.11	4	67.2
35.3	30.69	17	58.4	13	59.82	7	53.4	1	33.50	12	48.4	15	49.04	7	66.9
Sec δ, Tan δ	1.768		+1.457		1.121		+0.508		1.189		−0.644		1.034		+0.263
Mean Place	24ˢ.871		21″.84		55ˢ.057		24″.28		29ˢ.480		60″.14		44ˢ.504		41″.51
D′ψ α, Dω α	+0.03		−0.07		+0.01		−0.03		−0.01		+0.03		0.00		−0.01
Dψ δ, Dω δ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**τ^2 Eridani.** Mag. 4.8				**τ Persei.** Mag. 4.1				**η Eridani.** Mag. 4.0				**ϵ Arietis (*mean*).** Mag. 4.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 2 47		° ′ −21 20		h m 2 48		° ′ +52 24		h m 2 52		° ′ − 9 13		h m 2 54		° ′ +20 59	
	s		″		s		″		s		″		s		″	
Jan. 0.3	9.34		89.2		10.10		60.3		14.60		80.6		18.39		60.8	
10.3	9.23	11	90.4	12	9.93	17	61.2	9	14.51	9	81.6	10	18.31	8	60.6	2
20.3	9.09	14	91.3	9	9.72	21	61.8	6	14.40	11	82.4	8	18.20	11	60.4	2
30.3	8.94	15	91.9	6	9.47	25	61.9	1	14.27	13	83.0	6	18.07	13	60.0	4
Feb. 9.2	8.78	16	92.1	2	9.21	26	61.6	3	14.13	14	83.4	4	17.92	15	59.5	5
19.2	8.62	16	92.0	1	8.95	26	60.8	8	13.98	15	83.6	2	17.77	15	59.0	5
Mar. 1.2	8.46	16	91.5	5	8.70	25	59.7	11	13.84	14	83.5	1	17.62	15	58.4	6
11.2	8.32	14	90.7	8	8.47	23	58.3	14	13.71	13	83.2	3	17.49	13	57.7	7
21.1	8.20	12	89.6	11	8.29	18	56.6	17	13.59	12	82.6	6	17.38	11	57.1	6
31.1	8.10	10	88.2	14	8.15	14	54.8	18	13.51	8	81.7	9	17.30	8	56.5	6
Apr. 10.1	8.04	6	86.5	17	8.08	7	52.8	20	13.46	5	80.6	11	17.25	5	56.0	5
20.0	8.03	1	84.5	20	8.07	1	50.8	20	13.45	1	79.3	13	17.25	0	55.7	3
30.0	8.06	3	82.3	22	8.13	6	48.9	19	13.49	4	77.7	16	17.30	5	55.5	2
May 10.0	8.14	8	79.9	24	8.27	14	47.2	17	13.57	8	76.0	17	17.40	10	55.5	0
20.0	8.26	12	77.3	26	8.48	21	45.7	15	13.70	13	74.0	20	17.55	15	55.7	2
29.9	8.43	17	74.7	26	8.76	28	44.5	12	13.87	17	71.9	21	17.74	19	56.1	4
June 8.9	8.64	21	72.0	27	9.09	33	43.6	9	14.08	21	69.8	21	17.98	24	56.8	7
18.9	8.89	25	69.4	26	9.48	39	43.0	6	14.32	24	67.6	22	18.25	27	57.7	9
28.9	9.16	27	66.9	25	9.90	42	42.8	2	14.59	27	65.4	22	18.54	29	58.7	10
July 8.8	9.46	30	64.5	24	10.35	45	43.0	2	14.88	29	63.2	22	18.86	32	59.9	12
18.8	9.77	31	62.4	21	10.82	47	43.5	5	15.18	30	61.2	20	19.19	33	61.3	14
28.8	10.09	32	60.5	19	11.30	48	44.4	9	15.49	31	59.4	18	19.53	34	62.8	15
Aug. 7.7	10.41	32	59.0	15	11.78	48	45.6	12	15.81	32	57.9	15	19.87	34	64.2	14
17.7	10.72	31	57.9	11	12.25	47	47.1	15	16.11	30	56.6	13	20.20	33	65.7	15
27.7	11.02	30	57.2	7	12.70	45	48.9	18	16.40	29	55.6	10	20.51	31	67.2	15
Sept. 6.7	11.30	28	56.9	3	13.12	42	50.9	20	16.68	28	55.0	6	20.80	29	68.7	15
16.6	11.56	26	57.1	2	13.51	39	53.1	22	16.93	25	54.7	3	21.08	28	70.0	13
26.6	11.79	23	57.7	6	13.86	35	55.4	23	17.16	23	54.8	1	21.33	25	71.2	12
Oct. 6.6	11.99	20	58.6	9	14.18	32	57.9	25	17.36	20	55.2	4	21.55	22	72.3	11
16.5	12.15	16	59.9	13	14.45	27	60.4	25	17.53	17	55.9	7	21.75	20	73.2	9
26.5	12.28	13	61.5	16	14.67	22	62.8	24	17.67	14	56.8	9	21.91	16	74.0	8
Nov. 5.5	12.38	10	63.3	18	14.85	18	65.3	25	17.78	11	58.0	12	22.05	14	74.7	7
15.5	12.45	7	65.2	19	14.97	12	67.7	24	17.86	8	59.3	13	22.15	10	75.2	5
25.4	12.48	3	67.2	20	15.04	7	69.9	22	17.91	5	60.7	14	22.22	7	75.6	4
Dec. 5.4	12.48	0	69.1	19	15.06	2	71.9	20	17.93	2	62.0	13	22.26	4	75.9	3
15.4	12.44	4	70.9	18	15.02	4	73.7	18	17.91	2	63.4	14	22.26	0	76.1	2
25.4	12.37	7	72.5	16	14.93	9	75.2	15	17.87	4	64.7	13	22.23	3	76.1	0
35.3	12.28	9	73.9	14	14.79	14	76.4	12	17.80	7	65.8	11	22.17	6	76.0	1
Sec δ, Tan δ	1.074		−0.391		1.640		+1.299		1.013		−0.163		1.071		+0.384	
Mean Place	$8^s.173$		88″.39		$9^s.101$		40″.80		$13^s.538$		83″.38		$17^s.459$		49″.15	
$D'_\psi\alpha$, $D_\omega\alpha$	−0.01		+0.02		+0.02		−0.06		0.00		+0.01		+0.01		−0.02	
$D_\psi\delta$, $D_\omega\delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	47 H. Cephei. Mag. 5.7				θ Eridani. Mag. 3.4				α Ceti. Mag. 2.8				γ Persei. Mag. 3.1		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m 2 54 s		° ′ +79 4 ″		h m 2 54 s		° ′ −40 38 ″		h m 2 57 s		° ′ + 3 45 ″		h m 2 58 s		° +53 ″
Jan. 0.3	38.64		72.1		61.68		60.9		47.93		17.3		34.66		33.4
10.3	37.87	77	74.0	19	61.51	17	62.4	15	47.85	8	16.6	7	34.50	16	34.5
20.3	36.99	88	75.3	13	61.31	20	63.4	10	47.75	10	16.0	6	34.29	21	35.2
30.3	36.01	98	76.1	8	61.10	21	63.9	5	47.63	12	15.4	6	34.05	24	35.4
Feb. 9.2	34.99	102	76.2	1	60.87	23	63.9	0	47.49	14	15.0	4	33.79	26	35.2
19.2	33.97	102	75.7	5	60.64	23	63.5	4	47.35	14	14.6	4	33.52	27	34.6
Mar. 1.2	33.00	97	74.7	10	60.42	22	62.6	9	47.21	14	14.4	2	33.26	26	33.6
11.2	32.11	89	73.1	16	60.21	21	61.2	14	47.08	13	14.3	1	33.02	24	32.2
21.1	31.36	75	71.1	20	60.03	18	59.4	18	46.97	11	14.3	0	32.81	21	30.6
31.1	30.77	59	68.7	24	59.88	15	57.3	21	46.89	8	14.5	2	32.66	15	28.8
Apr. 10.1	30.37	40	66.0	27	59.78	10	54.8	25	46.84	5	14.9	4	32.57	9	26.9
20.0	30.18	19	63.2	28	59.72	6	52.0	28	46.84	0	15.6	7	32.54	3	24.9
30.0	30.21	3	60.4	28	59.72	0	49.0	30	46.88	4	16.4	8	32.59	5	23.0
May 10.0	30.46	25	57.6	28	59.77	5	45.8	32	46.96	8	17.4	10	32.72	13	21.2
20.0	30.92	46	55.0	26	59.87	10	42.6	32	47.09	13	18.6	12	32.92	20	19.6
29.9	31.58	66	52.6	24	60.03	16	39.3	33	47.26	17	20.0	14	33.18	26	18.2
June 8.9	32.42	84	50.6	20	60.24	21	36.0	33	47.47	21	21.5	15	33.51	33	17.2
18.9	33.42	100	48.9	17	60.49	25	32.9	31	47.72	25	23.2	17	33.89	38	16.5
28.9	34.55	113	47.7	12	60.78	29	30.0	29	47.99	27	24.9	17	34.31	42	16.2
July 8.8	35.77	122	47.0	7	61.10	32	27.4	26	48.28	29	26.7	18	34.76	45	16.2
18.8	37.07	130	46.7	3	61.45	35	25.1	23	48.59	31	28.5	18	35.24	48	16.6
28.8	38.40	133	46.9	2	61.80	35	23.3	18	48.91	32	30.2	17	35.72	48	17.3
Aug. 7.7	39.75	135	47.6	7	62.17	37	21.9	14	49.22	31	31.7	15	36.21	49	18.4
17.7	41.09	134	48.8	12	62.53	36	21.0	9	49.53	31	33.1	14	36.69	48	19.8
27.7	42.39	130	50.4	16	62.87	34	20.7	3	49.82	29	34.3	12	37.15	46	21.4
Sept. 6.7	43.62	123	52.4	20	63.19	32	20.9	2	50.10	28	35.3	10	37.59	44	23.3
16.6	44.77	115	54.8	24	63.49	30	21.7	8	50.36	26	36.1	8	37.99	40	25.4
26.6	45.81	104	57.5	27	63.76	27	23.0	13	50.59	23	36.6	5	38.37	38	27.7
Oct. 6.6	46.73	92	60.5	30	63.98	22	24.7	17	50.80	21	36.8	2	38.70	33	30.0
16.6	47.51	78	63.7	32	64.17	19	26.9	22	50.99	19	36.8	0	39.00	30	32.5
26.5	48.13	62	67.1	34	64.31	14	29.3	24	51.14	15	36.6	2	39.24	24	34.9
Nov. 5.5	48.58	45	70.5	34	64.41	10	31.9	26	51.26	12	36.2	4	39.44	20	37.4
15.5	48.84	26	73.9	34	64.46	5	34.7	28	51.36	10	35.6	6	39.58	14	39.8
25.4	48.91	7	77.3	34	64.47	1	37.4	27	51.42	6	35.0	6	39.67	9	42.0
Dec. 5.4	48.79	12	80.5	32	64.43	4	40.0	26	51.45	3	34.2	8	39.70	3	44.1
15.4	48.48	31	83.4	29	64.36	7	42.4	24	51.45	0	33.5	7	39.68	2	46.0
25.4	47.98	50	86.0	26	64.24	12	44.5	21	51.42	3	32.7	8	39.60	8	47.6
35.3	47.31	67	88.2	22	64.09	15	46.2	17	51.36	6	32.0	7	39.47	13	48.9
Sec δ, Tan δ	5.282		+5.186		1.318		−0.858		1.002		+0.066		1.668		+1.336
Mean Place	36ˢ.058		49″.01		60ˢ.134		55″.84		46ˢ.923		10″.62		33ˢ.551		13″.99
D′ψ a, Dω a	+0.09		−0.25		−0.02		+0.04		0.00		0.00		+0.02		−0.06
Dψ δ, Dω δ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ³ Eridani. Mag. 4.2				ρ Persei. Var. 3.4–4.2				μ Horologii. Mag. 5.2				θ Hydri. Mag. 5.5			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 2 58		° ′ −23 57		h m 2 59		° ′ +38 30		h m 3 1		° ′ −60 3		h m 3 2		° ′ −72 13	
	s		″		s		″		s		″		s		″	
Jan. 0.3	37.26	11	40.4	13	40.61	11	43.9	5	37.36	33	82.8	15	7.91	62	86.9	14
10.3	37.15	14	41.7	10	40.50	14	44.4	3	37.03	36	84.3	10	7.29	68	88.3	8
20.3	37.01	15	42.7	7	40.36	17	44.7	1	36.67	39	85.3	4	6.61	71	89.1	2
30.3	36.86	17	43.4	3	40.19	18	44.6	3	36.28	41	85.7	2	5.90	73	89.3	4
Feb. 9.2	36.69	17	43.7	1	40.01	19	44.3	6	35.87	40	85.5	7	5.17	72	88.9	10
19.2	36.52	17	43.6	5	39.82	19	43.7	9	35.47	39	84.8	13	4.45	70	87.9	15
Mar. 1.2	36.35	16	43.1	8	39.63	17	42.8	10	35.08	37	83.5	18	3.75	65	86.4	20
11.2	36.19	14	42.3	12	39.46	15	41.8	13	34.71	33	81.7	22	3.10	58	84.4	24
21.1	36.05	11	41.1	14	39.31	10	40.5	13	34.38	28	79.5	27	2.52	51	82.0	29
31.1	35.94	7	39.7	18	39.21	6	39.2	13	34.10	22	76.8	30	2.01	41	79.1	31
Apr. 10.1	35.87	3	37.9	21	39.15	1	37.9	13	33.88	15	73.8	32	1.60	31	76.0	35
20.0	35.84	2	35.8	23	39.14	5	36.6	12	33.73	8	70.6	35	1.29	19	72.5	36
30.0	35.86	6	33.5	25	39.19	11	35.4	10	33.65	0	67.1	36	1.10	7	68.9	37
May 10.0	35.92	11	31.0	26	39.30	16	34.4	9	33.65	7	63.5	37	1.03	5	65.2	37
20.0	36.03	16	28.4	27	39.46	22	33.5	6	33.72	16	59.8	36	1.08	17	61.5	37
29.9	36.19	20	25.7	28	39.68	26	32.9	3	33.88	22	56.2	35	1.25	29	57.8	35
June 8.9	36.39	23	22.9	27	39.94	31	32.6	0	34.10	30	52.7	33	1.54	40	54.3	33
18.9	36.62	27	20.2	26	40.25	34	32.6	3	34.40	36	49.4	31	1.94	50	51.0	29
28.9	36.89	29	17.6	25	40.59	37	32.9	6	34.76	40	46.3	27	2.44	58	48.1	26
July 8.8	37.18	31	15.1	22	40.96	38	33.5	8	35.16	45	43.6	22	3.02	65	45.5	21
18.8	37.49	32	12.9	19	41.34	39	34.3	10	35.61	48	41.4	17	3.67	70	43.4	16
28.8	37.81	33	11.0	15	41.73	39	35.3	13	36.09	49	39.7	12	4.37	74	41.8	10
Aug. 7.7	38.14	32	9.5	11	42.12	39	36.6	14	36.58	49	38.5	6	5.11	74	40.8	4
17.7	38.46	30	8.4	7	42.51	37	38.0	16	37.07	47	37.9	0	5.85	72	40.4	2
27.7	38.76	29	7.7	3	42.88	34	39.6	17	37.54	45	37.9	6	6.57	69	40.6	8
Sept. 6.7	39.05	26	7.4	3	43.22	33	41.3	18	37.99	42	38.5	12	7.26	63	41.4	15
16.6	39.31	24	7.7	6	43.55	30	43.1	18	38.41	37	39.7	18	7.89	56	42.9	20
26.6	39.55	21	8.3	11	43.85	27	44.9	18	38.78	31	41.5	22	8.45	46	44.9	24
Oct. 6.6	39.76	18	9.4	14	44.12	23	46.7	18	39.09	24	43.7	27	8.91	34	47.3	28
16.6	39.94	14	10.8	17	44.35	20	48.5	18	39.33	17	46.4	30	9.25	23	50.1	31
26.5	40.08	11	12.5	20	44.55	17	50.3	17	39.50	10	49.4	31	9.48	10	53.2	33
Nov. 5.5	40.19	8	14.5	21	44.72	12	52.0	15	39.60	3	52.5	32	9.58	3	56.5	33
15.5	40.27	4	16.6	21	44.84	8	53.5	15	39.63	5	55.7	32	9.55	16	59.8	32
25.4	40.31	0	18.7	21	44.92	5	55.0	13	39.58	12	58.9	30	9.39	28	63.0	30
Dec. 5.4	40.31	3	20.8	19	44.97	0	56.3	11	39.46	19	61.9	27	9.11	40	66.0	27
15.4	40.28	7	22.7	18	44.97	4	57.4	9	39.27	25	64.6	23	8.71	49	68.7	22
25.4	40.21	9	24.5	15	44.93	8	58.3	7	39.02	30	66.9	18	8.22	58	70.9	18
35.3	40.12		26.0		44.85		59.0		38ˢ.72		68.7		7.64		72.7	
Sec δ, Tan δ	1.094		−0.444		1.278		+0.796		2.004		−1.737		3.277		−3.121	
Mean Place	36ˢ.010		39″.39		39ˢ.611		27″.72		34ˢ.954		74″.93		4ˢ.023		77″.87	
D′ψ α, Dω α	−0.01		+0.02		+0.01		−0.04		−0.03		+0.08		−0.06		+0.15	
Dψ δ, Dω δ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**β Persei.** Var. 2.1–3.2				**δ Arietis.** Mag. 4.5				**12 Eridani.** Mag. 4.0				**48 H. Cephei.** Mag. 5.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 3 2		° ′ +40 37		h m 3 6		° ′ +19 24		h m 3 8		° ′ −29 18		h m 3 9		° ′ +77 25	
	s		″		s		″		s		″		s		″	
Jan. 0.4	35.07		47.1		43.52		19.2		26.39		94.2		24.59		35.4	
10.3	34.96	11	47.7	6	43.44	8	19.0	2	26.27	12	95.6	14	23.99	60	37.4	20
20.3	34.82	14	48.0	3	43.34	10	18.7	3	26.12	15	96.7	11	23.26	73	38.8	14
30.3	34.64	18	48.0	0	43.21	13	18.4	3	25.95	17	97.4	7	22.45	81	39.7	9
Feb. 9.2	34.45	19	47.7	3	43.07	14	18.0	4	25.77	18	97.7	3	21.58	87	40.0	3
19.2	34.25	20	47.2	5	42.92	15	17.5	5	25.58	19	97.6	1	20.70	88	39.7	3
Mar. 1.2	34.05	20	46.3	9	42.77	15	17.0	5	25.39	19	97.0	6	19.85	85	38.9	8
11.2	33.87	18	45.2	11	42.63	14	16.4	6	25.21	18	96.1	9	19.06	79	37.5	14
21.1	33.72	15	44.0	12	42.51	12	15.9	5	25.06	15	94.8	13	18.37	69	35.6	19
31.1	33.61	11	42.6	14	42.42	9	15.4	5	24.93	13	93.2	16	17.82	55	33.3	23
Apr. 10.1	33.54	7	41.2	14	42.37	5	15.0	4	24.84	9	91.2	20	17.43	39	30.8	25
20.1	33.53	1	39.8	14	42.36	1	14.7	3	24.79	5	88.9	23	17.22	21	28.1	27
30.0	33.57	4	38.5	13	42.39	3	14.5	2	24.79	0	86.4	25	17.20	2	25.3	28
May 10.0	33.68	11	37.3	12	42.48	9	14.6	1	24.84	5	83.7	27	17.36	16	22.5	28
20.0	33.84	16	36.3	10	42.61	13	14.9	3	24.94	10	80.8	29	17.72	36	19.9	26
29.9	34.06	22	35.6	7	42.79	18	15.4	5	25.08	14	77.9	29	18.26	54	17.5	24
June 8.9	34.33	27	35.2	4	43.01	22	16.1	7	25.27	19	74.9	30	18.96	70	15.4	21
18.9	34.64	31	35.1	1	43.27	26	16.9	8	25.50	23	72.0	29	19.80	84	13.6	18
28.9	34.99	35	35.2	1	43.56	29	18.0	11	25.77	27	69.2	28	20.76	96	12.3	13
July 8.8	35.37	38	35.7	5	43.87	31	19.2	12	26.06	29	66.7	25	21.81	105	11.4	9
18.8	35.76	39	36.4	7	44.20	33	20.5	13	26.38	32	64.4	23	22.94	113	10.9	5
28.8	36.16	40	37.4	10	44.53	33	21.9	14	26.70	32	62.4	20	24.12	118	11.0	1
Aug. 7.8	36.56	40	38.6	12	44.86	33	23.4	15	27.03	33	60.8	16	25.32	120	11.5	5
17.7	36.95	39	40.0	14	45.19	33	24.8	14	27.36	33	59.7	11	26.51	119	12.4	9
27.7	37.33	38	41.6	16	45.51	32	26.2	14	27.68	32	59.0	7	27.67	116	13.8	14
Sept. 6.7	37.69	36	43.3	17	45.81	30	27.5	13	27.98	30	58.8	2	28.79	112	15.6	18
16.6	38.03	34	45.1	18	46.09	28	28.7	12	28.26	28	59.2	4	29.84	105	17.8	22
26.6	38.34	31	47.0	19	46.35	26	29.8	11	28.51	25	60.0	8	30.81	97	20.3	25
Oct. 6.6	38.61	27	48.9	19	46.58	23	30.7	9	28.74	23	61.2	12	31.68	87	23.1	28
16.6	38.86	25	50.7	18	46.78	20	31.6	9	28.93	19	62.9	17	32.43	75	26.2	31
26.5	39.07	21	52.6	19	46.96	18	32.2	6	29.08	15	64.8	19	33.05	62	29.4	32
Nov. 5.5	39.24	17	54.4	18	47.10	14	32.7	5	29.20	12	67.0	22	33.52	47	32.7	33
15.5	39.37	13	56.1	17	47.22	12	33.1	4	29.28	8	69.3	23	33.84	32	36.1	34
25.5	39.46	9	57.6	15	47.30	8	33.4	3	29.32	4	71.7	24	33.98	14	39.4	33
Dec. 5.4	39.51	5	59.0	14	47.35	5	33.6	2	29.33	1	74.0	23	33.96	2	42.6	32
15.4	39.51	0	60.3	13	47.37	2	33.7	1	29.30	3	76.2	22	33.76	20	45.5	29
25.4	39.47	4	61.3	10	47.35	2	33.6	1	29.23	7	78.2	20	33.40	36	48.1	26
35.3	39.38	9	62.1	8	47.29	6	33.5	1	29.13	10	79.9	17	32.89	51	50.4	23
Sec δ, Tan δ	1.318		+0.858		1.060		+0.352		1.147		−0.562		4.593		+4.483	
Mean Place	34ˢ.043		30″.40		42ˢ.510		7″.94		25ˢ.015		92″.28		21ˢ.854		12″.87	
D′ψ α, Dω α	+0.02		−0.04		+0.01		−0.02		−0.01		+0.03		+0.09		−0.20	
Dψ δ, Dω δ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ζ Arietis.** Mag. 5.0				**38 Horologii (G.).** Mag. 5.7				**ζ Eridani.** Mag. 4.9				**τ Arietis.** Mag. 5.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 9		+20 43		3 10		−57 37		3 11		− 9 7		3 16		+20 50	
	s		″		s		″		s		″		s		″	
Jan. 0.4	58.32		46.5		24.55		103.1		40.44		75.2		16.61		27.3	
10.3	58.25	7	46.4	1	24.26	29	104.8	17	40.36	8	76.3	11	16.54	7	27.2	1
20.3	58.15	10	46.1	3	23.93	33	105.9	11	40.25	11	77.2	9	16.44	10	27.0	2
30.3	58.02	13	45.8	3	23.57	36	106.4	5	40.12	13	77.9	7	16.32	12	26.7	3
Feb. 9.2	57.88	14	45.4	4	23.20	37	106.4	0	39.98	14	78.3	4	16.18	14	26.4	3
19.2	57.72	16	44.9	5	22.82	38	105.8	6	39.83	15	78.5	2	16.02	16	25.9	5
Mar. 1.2	57.57	15	44.4	5	22.45	37	104.7	11	39.68	15	78.5	0	15.86	16	25.4	5
11.2	57.42	15	43.8	6	22.11	34	103.1	16	39.54	14	78.2	3	15.72	14	24.8	6
21.1	57.30	12	43.2	6	21.80	31	101.0	21	39.41	13	77.7	5	15.59	13	24.2	6
31.1	57.21	9	42.7	5	21.53	27	98.5	25	39.31	10	76.9	8	15.49	10	23.7	5
Apr. 10.1	57.15	6	42.2	5	21.31	22	95.6	29	39.24	7	75.9	10	15.43	6	23.2	5
20.1	57.14	1	41.9	3	21.16	15	92.5	31	39.22	2	74.6	13	15.41	2	22.9	3
30.0	57.17	3	41.7	2	21.08	8	89.1	34	39.24	2	73.1	15	15.44	3	22.7	2
May 10.0	57.25	8	41.6	1	21.07	1	85.6	35	39.30	6	71.4	17	15.52	8	22.6	1
20.0	57.39	14	41.8	2	21.13	6	81.9	37	39.41	11	69.5	19	15.64	12	22.8	2
29.9	57.57	18	42.2	4	21.27	14	78.3	36	39.56	15	67.5	20	15.81	17	23.1	3
June 8.9	57.79	22	42.8	6	21.47	20	74.8	35	39.75	19	65.3	22	16.03	22	23.7	6
18.9	58.04	25	43.6	8	21.74	27	71.5	33	39.98	23	63.1	22	16.28	25	24.5	8
28.9	58.33	29	44.6	10	22.07	33	68.4	31	40.23	25	60.9	22	16.57	29	25.4	9
July 8.8	58.64	31	45.7	11	22.45	38	65.6	28	40.51	28	58.8	21	16.87	30	26.5	11
18.8	58.97	33	47.0	13	22.87	42	63.3	23	40.81	30	56.8	20	17.20	33	27.7	12
28.8	59.30	33	48.3	13	23.32	45	61.4	19	41.12	31	55.0	18	17.53	33	29.0	13
Aug. 7.8	59.64	34	49.7	14	23.78	46	60.1	13	41.43	31	53.4	16	17.87	34	30.4	14
17.7	59.97	33	51.1	14	24.24	46	59.4	7	41.74	31	52.0	14	18.20	33	31.8	14
27.7	60.29	32	52.5	14	24.69	45	59.2	2	42.03	29	51.0	10	18.52	32	33.1	13
Sept. 6.7	60.59	30	53.8	13	25.13	44	59.7	5	42.31	28	50.4	6	18.83	31	34.4	13
16.6	60.88	29	55.1	13	25.53	40	60.8	11	42.58	27	50.1	3	19.11	28	35.6	12
26.6	61.14	26	56.2	11	25.89	36	62.4	16	42.82	24	50.1	0	19.38	27	36.7	11
Oct. 6.6	61.37	23	57.2	10	26.19	30	64.6	22	43.03	21	50.5	4	19.62	24	37.6	9
16.6	61.58	21	58.0	8	26.44	25	67.2	26	43.22	19	51.2	7	19.84	22	38.5	9
26.5	61.76	18	58.7	7	26.62	18	70.0	28	43.38	16	52.2	10	20.03	19	39.2	7
Nov. 5.5	61.92	16	59.3	6	26.74	12	73.1	31	43.51	13	53.4	12	20.19	16	39.8	6
15.5	62.04	12	59.8	5	26.79	5	76.3	32	43.61	10	54.7	13	20.31	12	40.2	4
25.5	62.12	8	60.2	4	26.76	3	79.5	32	43.68	7	56.1	14	20.41	10	40.6	4
Dec. 5.4	62.18	6	60.4	2	26.67	9	82.5	30	43.71	3	57.6	15	20.47	6	40.8	2
15.4	62.19	1	60.6	2	26.52	15	85.3	28	43.71	0	59.0	14	20.49	2	40.9	1
25.4	62.17	2	60.6	0	26.30	22	87.7	24	43.68	3	60.3	13	20.48	1	41.0	1
35.3	62.12	5	60.5	1	26.04	26	89.7	20	43.62	6	61.5	12	20.43	5	40.9	1
Sec δ, Tan δ	1.069		+0.378		1.868		−1.578		1.013		−0.161		1.070		+0.381	
Mean Place	$57^{s}.299$		$34''.89$		$22^{s}.249$		$96''.13$		$39^{s}.291$		$78''.58$		$15^{s}.550$		$15''.70$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.01		−0.02		−0.03		+0.07		0.00		+0.01		+0.01		−0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*e* Eridani. Mag. 4.3				*ι* Hydri. Mag. 5.5				*α* Persei. Mag. 1.9				*o* Tauri. Mag. 3.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 3 16		° ′ −43 23		h m 3 17		° ′ −77 41		h m 3 18		° ′ +49 33		h m 3 20		° ′ + 8 43	
	s		″		s		″		s		″		s		″	
Jan. 0.4	31.28		57.6		70.39		78.9		11.79		39.8		12.08		45.3	
10.3	31.11	17	59.3	17	69.47	92	80.5	16	11.66	13	40.9	11	12.01	7	44.8	5
20.3	30.91	20	60.5	12	68.47	100	81.4	9	11.49	17	41.6	7	11.92	9	44.3	5
30.3	30.69	22	61.2	7	67.40	107	81.8	4	11.28	21	41.9	3	11.81	11	43.8	5
Feb. 9.3	30.46	23	61.5	3	66.30	110	81.6	2	11.05	23	41.9	0	11.67	14	43.3	5
19.2	30.21	25	61.2	3	65.21	109	80.8	8	10.80	25	41.5	4	11.52	15	42.9	4
Mar. 1.2	29.97	24	60.4	8	64.14	107	79.4	14	10.55	25	40.7	8	11.37	15	42.6	3
11.2	29.74	23	59.2	12	63.13	101	77.6	18	10.32	23	39.6	11	11.23	14	42.4	2
21.1	29.53	21	57.5	17	62.21	92	75.3	23	10.12	20	38.2	14	11.11	12	42.2	2
31.1	29.36	17	55.4	21	61.39	82	72.6	27	9.97	15	36.6	16	11.01	10	42.2	0
Apr. 10.1	29.23	13	53.0	24	60.70	69	69.5	31	9.86	11	34.9	17	10.95	6	42.3	1
20.1	29.14	9	50.2	28	60.15	55	66.2	33	9.82	4	33.1	18	10.92	3	42.6	3
30.0	29.11	3	47.2	30	59.76	39	62.7	35	9.84	2	31.4	17	10.94	2	43.1	5
May 10.0	29.13	2	44.0	32	59.53	23	59.0	37	9.93	9	29.8	16	11.01	7	43.8	7
20.0	29.21	8	40.7	33	59.48	5	55.3	37	10.09	16	28.3	15	11.12	11	44.7	9
30.0	29.35	14	37.3	34	59.60	12	51.7	36	10.32	23	27.0	13	11.28	16	45.7	10
June 8.9	29.54	19	34.0	33	59.89	29	48.2	35	10.61	29	26.0	10	11.48	20	46.9	12
18.9	29.78	24	30.7	33	60.34	45	44.9	33	10.94	33	25.3	7	11.71	23	48.3	14
28.9	30.06	28	27.7	30	60.94	60	41.9	30	11.32	38	24.9	4	11.97	26	49.7	14
July 8.8	30.38	32	24.9	28	61.67	73	39.3	26	11.73	41	24.9	0	12.26	29	51.2	15
18.8	30.73	35	22.5	24	62.52	85	37.1	22	12.17	44	25.2	3	12.57	31	52.8	16
28.8	31.10	37	20.4	21	63.45	93	35.4	17	12.62	45	25.8	6	12.88	31	54.3	15
Aug. 7.8	31.47	37	18.9	15	64.44	99	34.3	11	13.08	46	26.6	8	13.20	32	55.8	15
17.7	31.85	38	17.9	10	65.46	102	33.8	5	13.53	45	27.8	12	13.51	31	57.2	14
27.7	32.22	37	17.4	5	66.47	101	33.9	1	13.97	44	29.2	14	13.82	31	58.4	12
Sept. 6.7	32.57	35	17.5	1	67.45	98	34.6	7	14.40	43	30.8	16	14.11	29	59.4	10
16.7	32.90	33	18.2	7	68.36	91	36.0	14	14.80	40	32.6	18	14.38	27	60.3	9
26.6	33.20	30	19.4	12	69.16	80	37.8	18	15.17	37	34.6	20	14.63	25	60.9	6
Oct. 6.6	33.46	26	21.1	17	69.84	68	40.2	24	15.51	34	36.7	21	14.86	23	61.3	4
16.6	33.68	22	23.2	21	70.37	53	43.0	28	15.81	30	38.8	21	15.07	21	61.5	2
26.5	33.86	18	25.7	25	70.73	36	46.0	30	16.07	26	41.0	22	15.25	18	61.5	0
Nov. 5.5	33.99	13	28.4	27	70.90	17	49.3	33	16.29	22	43.2	22	15.40	15	61.3	2
15.5	34.08	9	31.3	29	70.88	2	52.6	33	16.46	17	45.3	21	15.52	12	61.0	3
25.5	34.11	3	34.2	29	70.67	21	55.9	33	16.58	12	47.4	21	15.61	9	60.6	4
Dec. 5.4	34.10	1	37.0	28	70.27	40	58.9	30	16.64	6	49.3	19	15.66	5	60.1	5
15.4	34.04	6	39.6	26	69.70	57	61.7	28	16.66	2	51.0	17	15.69	3	59.6	5
25.4	33.94	10	41.9	23	68.98	72	64.1	24	16.61	5	52.5	15	15.68	1	59.0	6
35.4	33.79	15	43.9	20	68.13	85	66.0	19	16.52	9	53.8	13	15.63	5	58.5	5
Sec δ, Tan δ	1.376		−0.946		4.694		−4.586		1.542		+1.173		1.012		+0.154	
Mean Place	29s.562		53″.22		64s.693		70″.84		10s.527		21″.53		10s.987		36″.95	
D′ψ α, Dω α	−0.02		+0.04		−0.09		+0.20		+0.02		−0.05		0.00		−0.01	
Dψ δ, Dω δ	+0.3		+0.8		+0.3		+0.8		+0.3		+0.8		+0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**2 H. Camelop.** Mag. 4.4				**ξ Tauri.** Mag. 3.8				**f Tauri.** Mag. 4.3				**ε Eridani.** Mag. 3.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 22		+59 38		3 22		+ 9 26		3 26		+12 38		3 28		− 9 44	
	s		″		s		″		s		″		s		″	
Jan. 0.4	7.27	18	49.9	15	31.48	6	8.9	5	8.49	6	43.2	4	53.89	7	51.4	12
10.3	7.09	25	51.4	10	31.42	9	8.4	5	8.43	9	42.8	4	53.82	10	52.6	10
20.3	6.84	29	52.4	7	31.33	12	7.9	5	8.34	11	42.4	4	53.72	13	53.6	8
30.3	6.55	32	53.1	1	31.21	13	7.4	4	8.23	14	42.0	4	53.59	15	54.4	5
Feb. 9.3	6.23	33	53.2	3	31.08	15	7.0	4	8.09	15	41.6	4	53.44	15	54.9	3
19.2	5.90	34	52.9	8	30.93	15	6.6	4	7.94	15	41.2	4	53.29	16	55.2	0
Mar. 1.2	5.56	31	52.1	12	30.78	14	6.2	2	7.79	14	40.8	4	53.13	16	55.2	3
11.2	5.25	28	50.9	15	30.64	12	6.0	2	7.65	13	40.4	2	52.97	14	54.9	5
21.1	4.97	22	49.4	18	30.52	10	5.8	0	7.52	10	40.2	2	52.83	11	54.4	7
31.1	4.75	16	47.6	20	30.42	7	5.8	1	7.42	7	40.0	1	52.72	8	53.7	10
Apr. 10.1	4.59	8	45.6	22	30.35	2	5.9	2	7.35	3	39.9	1	52.64	5	52.7	13
20.1	4.51	1	43.4	22	30.33	2	6.1	5	7.32	1	40.0	3	52.59	0	51.4	15
30.0	4.52	10	41.2	21	30.35	6	6.6	6	7.33	7	40.3	4	52.59	4	49.9	17
May 10.0	4.62	18	39.1	20	30.41	11	7.2	8	7.40	11	40.7	6	52.63	9	48.2	19
20.0	4.80	26	37.1	17	30.52	16	8.0	10	7.51	15	41.3	8	52.72	14	46.3	20
30.0	5.06	34	35.4	15	30.68	19	9.0	12	7.66	20	42.1	10	52.86	17	44.3	21
June 8.9	5.40	40	33.9	12	30.87	24	10.2	13	7.86	23	43.1	11	53.03	21	42.2	22
18.9	5.80	46	32.7	9	31.11	26	11.5	14	8.09	27	44.2	13	53.24	24	40.0	22
28.9	6.26	50	31.8	5	31.37	29	12.9	15	8.36	29	45.5	14	53.48	27	37.8	21
July 8.8	6.76	54	31.3	1	31.66	30	14.4	15	8.65	30	46.9	14	53.75	29	35.7	20
18.8	7.30	55	31.2	3	31.96	32	15.9	15	8.95	32	48.3	14	54.04	30	33.7	19
28.8	7.85	57	31.5	7	32.28	31	17.4	15	9.27	32	49.7	14	54.34	31	31.8	16
Aug. 7.8	8.42	56	32.2	10	32.59	32	18.9	13	9.59	32	51.1	13	54.65	30	30.2	13
17.7	8.98	55	33.2	13	32.91	31	20.2	12	9.91	31	52.4	12	54.95	30	28.9	10
27.7	9.53	53	34.5	16	33.22	29	21.4	11	10.22	30	53.6	11	55.25	29	27.9	7
Sept. 6.7	10.06	50	36.1	19	33.51	27	22.5	8	10.52	28	54.7	10	55.54	27	27.2	3
16.7	10.56	47	38.0	21	33.78	26	23.3	7	10.80	26	55.7	7	55.81	25	26.9	1
26.6	11.03	43	40.1	24	34.04	23	24.0	4	11.06	24	56.4	6	56.06	23	27.0	4
Oct. 6.6	11.46	37	42.5	24	34.27	21	24.4	2	11.30	21	57.0	3	56.29	20	27.4	8
16.6	11.83	33	44.9	26	34.48	18	24.6	1	11.51	19	57.3	2	56.49	17	28.2	10
26.5	12.16	27	47.5	26	34.66	15	24.7	2	11.70	16	57.5	1	56.66	15	29.2	13
Nov. 5.5	12.43	21	50.1	27	34.81	13	24.5	2	11.86	13	57.6	1	56.81	11	30.5	14
15.5	12.64	14	52.8	25	34.94	9	24.3	4	11.99	10	57.5	2	56.92	8	31.9	15
25.5	12.78	7	55.3	25	35.03	6	23.9	5	12.09	7	57.3	2	57.00	5	33.4	15
Dec. 5.4	12.85	0	57.8	22	35.09	2	23.4	5	12.16	3	57.1	4	57.05	1	34.9	15
15.4	12.85	8	60.0	20	35.11	1	22.9	5	12.19	1	56.7	4	57.06	2	36.4	15
25.4	12.77	14	62.0	17	35.10	4	22.4	5	12.18	4	56.3	4	57.04	5	37.9	13
35.4	12.63		63.7		35.06		21.9		12.14		55.9		56.99		39.2	
Sec δ, Tan δ	1.979		+1.708		1.014		+0.166		1.025		+0.224		1.015		−0.172	
Mean Place	5ˢ.726		29″.92		30ˢ.382		0″.30		7ˢ.377		33″.71		52ˢ.666		55″.12	
D′ψα, Dωα	+0.03		−0.07		0.00		−0.01		0.00		−0.01		0.00		+0.01	
Dψδ, Dωδ	+0.3		+0.8		+0.3		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ^5 **Eridani.** Mag. 4.3				δ **Persei.** Mag. 3.1				δ **Eridani.** Mag. 3.7				ν **Persei.** Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 29		−21 54		3 36		+47 30		3 39		−10 2		3 39		+42 18	
	s		″		s		″		s		″		s		″	
Jan. 0.4	60.60		74.2		49.12		66.0		8.94		70.5		22.11		44.6	
10.3	60.51	9	75.7	15	49.02	10	67.1	11	8.88	6	71.7	12	22.03	8	45.5	9
20.3	60.39	12	76.9	12	48.87	15	67.9	8	8.78	10	72.7	10	21.90	13	46.1	6
30.3	60.25	14	77.7	8	48.68	19	68.4	5	8.66	12	73.5	8	21.74	16	46.5	4
Feb. 9.3	60.08	17	78.2	5	48.47	21	68.5	1	8.51	15	74.1	6	21.55	19	46.5	0
19.2	59.91	17	78.4	2	48.23	24	68.2	3	8.35	16	74.4	3	21.34	21	46.2	3
Mar. 1.2	59.73	18	78.2	2	47.99	24	67.6	6	8.19	16	74.4	0	21.13	21	45.7	5
11.2	59.56	17	77.7	5	47.76	23	66.7	9	8.04	15	74.2	2	20.92	21	44.9	8
21.2	59.41	15	76.8	9	47.56	20	65.5	12	7.89	15	73.7	5	20.73	19	43.8	11
31.1	59.28	13	75.6	12	47.39	17	64.1	14	7.77	12	72.9	8	20.58	15	42.6	12
Apr. 10.1	59.18	10	74.0	16	47.27	12	62.6	15	7.68	9	71.9	10	20.47	11	41.3	13
20.1	59.12	6	72.2	18	47.21	6	61.0	16	7.63	5	70.7	12	20.42	5	39.9	14
30.0	59.11	1	70.1	21	47.21	0	59.3	17	7.62	1	69.2	15	20.42	0	38.5	14
May 10.0	59.14	3	67.8	23	47.28	7	57.8	15	7.66	4	67.5	17	20.48	6	37.2	13
20.0	59.22	8	65.3	25	47.41	13	56.3	15	7.74	8	65.6	19	20.60	12	36.1	11
30.0	59.34	12	62.7	26	47.60	19	55.1	12	7.86	12	63.6	20	20.78	18	35.1	10
June 8.9	59.51	17	60.1	26	47.86	26	54.1	10	8.03	17	61.5	21	21.02	24	34.3	8
18.9	59.72	21	57.4	27	48.17	31	53.3	8	8.23	20	59.3	22	21.31	29	33.8	5
28.9	59.97	25	54.8	26	48.52	35	52.9	4	8.47	24	57.1	22	21.63	32	33.6	2
July 8.9	60.24	27	52.4	24	48.91	39	52.7	2	8.74	27	54.9	22	21.99	36	33.6	0
18.8	60.53	29	50.1	23	49.32	41	52.8	1	9.02	28	52.8	21	22.37	38	33.9	3
28.8	60.84	31	48.1	20	49.75	43	53.3	5	9.32	30	51.0	18	22.77	40	34.5	6
Aug. 7.8	61.15	31	46.5	16	50.19	44	54.0	7	9.62	30	49.4	16	23.18	41	35.3	8
17.7	61.47	32	45.2	13	50.63	44	54.9	9	9.93	31	48.0	14	23.59	41	36.3	10
27.7	61.78	31	44.3	9	51.07	44	56.1	12	10.23	30	47.0	10	23.99	40	37.4	11
Sept. 6.7	62.07	29	43.9	4	51.49	42	57.5	14	10.52	29	46.3	7	24.38	39	38.8	14
16.7	62.35	28	44.0	1	51.89	40	59.1	16	10.80	28	46.0	3	24.75	37	40.3	15
26.6	62.61	26	44.5	5	52.26	37	60.8	17	11.06	26	46.0	0	25.10	35	41.8	15
Oct. 6.6	62.84	23	45.4	9	52.61	35	62.6	18	11.29	23	46.4	4	25.42	32	43.4	16
16.6	63.05	21	46.7	13	52.93	32	64.5	19	11.50	21	47.2	8	25.72	30	45.1	17
26.6	63.23	18	48.3	16	53.21	28	66.5	20	11.69	19	48.2	10	25.98	26	46.8	17
Nov. 5.5	63.37	14	50.2	19	53.45	24	68.4	19	11.85	16	49.5	13	26.20	22	48.5	17
15.5	63.48	11	52.2	20	53.64	19	70.4	20	11.97	12	50.9	14	26.39	19	50.1	16
25.5	63.55	7	54.4	22	53.79	15	72.3	19	12.06	9	52.5	16	26.53	14	51.7	16
Dec. 5.4	63.59	4	56.5	21	53.88	9	74.1	18	12.12	6	54.1	16	26.62	9	53.2	15
15.4	63.59	0	58.6	21	53.92	4	75.8	17	12.14	2	55.6	15	26.67	5	54.6	14
25.4	63.55	4	60.5	19	53.90	2	77.3	15	12.13	1	57.1	15	26.67	0	55.8	12
35.4	63.48	7	62.2	17	53.84	6	78.5	12	12.09	4	58.4	13	26.62	5	56.8	10
Sec δ, Tan δ	1.078		−0.402		1.481		+1.092		1.016		−0.177		1.352		+0.910	
Mean Place	$59^{s}.257$		$74''.92$		$47^{s}.724$		$48''.63$		$7^{s}.675$		$74''.42$		$20^{s}.776$		$28''.33$	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.01		+0.02		+0.02		−0.04		0.00		+0.01		+0.02		−0.04	
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**5 H. Camelop.** Mag. 4.7				**η Tauri.** Mag. 3.0				**τ⁶ Eridani.** Mag. 4.3				**g Eridani.** Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 41		+71 4		3 42		+23 50		3 43		−23 29		3 46		−36 27	
	s		″		s		″		s		″		s		″	
Jan. 0.4	18.19		27.2		23.37		36.1		10.27		68.1		15.84		37.4	
10.4	17.89	30	29.3	21	23.32	5	36.2	1	10.18	9	69.7	16	15.71	13	39.3	19
20.3	17.49	40	30.9	16	23.23	9	36.2	0	10.06	12	71.1	14	15.56	15	40.8	15
30.3	17.01	48	32.0	11	23.11	12	36.0	2	9.92	14	72.1	10	15.37	19	41.9	11
Feb. 9.3	16.48	53	32.6	6	22.96	15	35.8	2	9.75	17	72.7	6	15.16	21	42.6	7
19.2	15.92	56	32.6	0	22.80	16	35.4	4	9.57	18	73.0	3	14.94	22	42.7	1
Mar. 1.2	15.35	57	32.1	5	22.64	16	35.0	4	9.38	19	72.9	1	14.71	23	42.4	3
11.2	14.80	55	31.1	10	22.48	16	34.5	5	9.20	18	72.4	5	14.48	23	41.7	7
21.2	14.31	49	29.7	14	22.33	15	33.9	6	9.04	16	71.5	9	14.28	20	40.5	12
31.1	13.90	41	27.8	19	22.21	12	33.3	6	8.89	15	70.3	12	14.10	18	38.9	16
Apr. 10.1	13.58	32	25.6	22	22.13	8	32.7	6	8.78	11	68.8	15	13.95	15	37.0	19
20.1	13.38	20	23.2	24	22.09	4	32.2	5	8.71	7	67.0	18	13.84	11	34.7	23
30.1	13.30	8	20.6	26	22.09	0	31.9	3	8.68	3	64.9	21	13.78	6	32.1	26
May 10.0	13.36	6	18.0	26	22.14	5	31.6	3	8.69	1	62.6	23	13.77	1	29.2	29
20.0	13.54	18	15.5	25	22.24	10	31.5	1	8.75	6	60.1	25	13.82	5	26.2	30
30.0	13.85	31	13.2	23	22.39	15	31.6	1	8.87	12	57.5	26	13.92	10	23.1	31
June 8.9	14.28	43	11.1	21	22.59	20	31.9	3	9.02	15	54.8	27	14.06	14	20.0	31
18.9	14.81	53	9.2	19	22.83	24	32.3	4	9.22	20	52.1	27	14.26	20	16.9	31
28.9	15.44	63	7.7	15	23.10	27	33.0	7	9.45	23	49.5	26	14.49	23	13.9	30
July 8.9	16.14	70	6.6	11	23.40	30	33.8	8	9.71	26	47.0	25	14.76	27	11.1	28
18.8	16.90	76	5.9	7	23.71	31	34.7	9	10.00	29	44.7	23	15.06	30	8.6	25
28.8	17.71	81	5.6	3	24.05	34	35.8	11	10.30	30	42.7	20	15.39	33	6.4	22
Aug. 7.8	18.54	83	5.8	2	24.39	34	36.9	11	10.62	32	41.0	17	15.72	33	4.6	18
17.7	19.38	84	6.3	5	24.73	34	38.1	12	10.93	31	39.7	13	16.06	34	3.3	13
27.7	20.21	83	7.3	10	25.06	33	39.2	11	11.24	31	38.8	9	16.40	34	2.6	7
Sept. 6.7	21.03	82	8.6	13	25.38	32	40.4	12	11.54	30	38.4	4	16.73	33	2.3	3
16.7	21.81	78	10.3	17	25.69	31	41.5	11	11.83	29	38.4	0	17.04	31	2.6	3
26.6	22.54	73	12.4	21	25.98	29	42.5	10	12.10	27	38.9	5	17.34	30	3.5	9
Oct. 6.6	23.22	68	14.7	23	26.25	27	43.4	9	12.34	24	39.8	9	17.60	26	4.8	13
16.6	23.83	61	17.3	26	26.49	24	44.3	9	12.56	22	41.2	14	17.84	24	6.7	19
26.6	24.36	53	20.1	28	26.71	22	45.0	7	12.75	19	42.9	17	18.04	20	8.9	22
Nov. 5.5	24.80	44	23.0	29	26.90	19	45.6	6	12.91	16	44.9	20	18.19	15	11.4	25
15.5	25.14	34	26.0	30	27.06	16	46.2	6	13.03	12	47.1	22	18.31	12	14.1	27
25.5	25.38	24	29.1	31	27.19	13	46.7	5	13.11	8	49.3	22	18.39	8	16.9	28
Dec. 5.4	25.50	12	32.1	30	27.28	9	47.1	4	13.16	5	51.6	23	18.42	3	19.6	27
15.4	25.50	0	34.9	28	27.33	5	47.4	3	13.17	1	53.8	22	18.40	2	22.3	27
25.4	25.38	12	37.4	25	27.34	1	47.6	2	13.14	3	55.9	21	18.35	5	24.7	24
35.4	25.15	23	39.7	23	27.31	3	47.7	1	13.07	7	57.7	18	18.25	10	26.9	22
Sec δ, Tan δ	3.083		+2.916		1.093		+0.442		1.090		−0.435		1.243		−0.739	
Mean Place	15ˢ.607		6″.52		22ˢ.158		23″.90		8ˢ.853		69″.05		14ˢ.189		35″.93	
D′ψ a, Dω a	+0.06		−0.11		+0.01		−0.02		−0.01		+0.02		−0.02		+0.03	
Dψ δ, Dω δ	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Hydri. Mag. 3.2				ζ Persei. Mag. 2.9				9 H. Camelop. Mag. 5.2				ε Persei. Mag. 3.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 3 48		° ′ −74 29		h m 3 48		° ′ +31 37		h m 3 49		° ′ +60 51		h m 3 52		° ′ +39 45	
	s		″		s		″		s		″		s		″	
Jan. 0.4	38.23	66	75.6	20	44.63	5	58.6	4	49.59	16	47.9	18	6.12	6	59.9	9
10.4	37.57	75	77.6	14	44.58	10	59.0	3	49.43	22	49.7	13	6.06	11	60.8	6
20.3	36.82	81	79.0	9	44.48	13	59.3	1	49.21	28	51.0	10	5.95	15	61.4	3
30.3	36.01	86	79.9	4	44.35	15	59.4	1	48.93	32	52.0	5	5.80	18	61.7	1
Feb. 9.3	35.15	88	80.3	3	44.20	18	59.3	3	48.61	35	52.5	0	5.62	20	61.8	2
19.2	34.27	88	80.0	8	44.02	18	59.0	4	48.26	36	52.5	4	5.42	20	61.6	4
Mar. 1.2	33.39	85	79.2	14	43.84	18	58.6	6	47.90	34	52.1	9	5.22	20	61.2	7
11.2	32.54	79	77.8	18	43.66	16	58.0	8	47.56	32	51.2	13	5.02	19	60.5	9
21.2	31.75	72	76.0	23	43.50	13	57.2	8	47.24	27	49.9	16	4.83	15	59.6	11
31.1	31.03	63	73.7	27	43.37	10	56.4	9	46,97	20	48.3	19	4.68	11	58.5	12
Apr. 10.1	30.40	53	71.0	30	43.27	6	55.5	8	46.77	13	46.4	21	4.57	7	57.3	12
20.1	29.87	40	68.0	33	43.21	0	54.7	8	46.64	5	44.3	22	4.50	1	56.1	12
30.1	29.47	27	64.7	35	43.21	5	53.9	8	46.59	5	42.1	21	4.49	4	54.9	12
May 10.0	29.20	14	61.2	36	43.26	10	53.1	5	46.64	13	40.0	21	4.53	11	53.7	10
20.0	29.06	1	57.6	37	43.36	15	52.6	4	46.77	22	37.9	20	4.64	16	52.7	9
30.0	29.07	14	53.9	36	43.51	21	52.2	2	46.99	30	35.9	17	4.80	22	51.8	7
June 8.9	29.21	29	50.3	34	43.72	24	52.0	0	47.29	38	34.2	15	5.02	26	51.1	4
18.9	29.50	41	46.9	32	43.96	29	52.0	2	47.67	44	32.7	12	5.28	30	50.7	3
28.9	29.91	52	43.7	29	44.25	31	52.2	4	48.11	49	31.5	8	5.58	34	50.4	0
July 8.9	30.43	63	40.8	25	44.56	34	52.6	6	48.60	53	30.7	5	5.92	37	50.4	3
18.8	31.06	71	38.3	20	44.90	35	53.2	8	49.13	56	30.2	1	6.29	38	50.7	5
28.8	31.77	77	36.3	16	45.25	36	54.0	9	49.69	58	30.1	2	6.67	39	51.2	7
Aug. 7.8	32.54	82	34.7	9	45.61	36	54.9	10	50.27	58	30.3	6	7.06	40	51.9	9
17.8	33.36	83	33.8	3	45.97	36	55.9	11	50.85	59	30.9	9	7.46	39	52.8	11
27.7	34.19	81	33.5	3	46.33	34	57.0	12	51.44	57	31.8	13	7.85	38	53.9	12
Sept. 6.7	35.00	78	33.8	9	46.67	33	58.2	12	52.01	54	33.1	15	8.23	37	55.1	13
16.7	35.78	72	34.7	15	47.00	32	59.4	12	52.55	52	34.6	18	8.60	35	56.4	13
26.6	36.50	63	36.2	21	47.32	29	60.6	12	53.07	49	36.4	20	8.95	32	57.7	14
Oct. 6.6	37.13	52	38.3	25	47.61	27	61.8	11	53.56	44	38.4	23	9.27	30	59.1	15
16.6	37.65	40	40.8	30	47.88	24	62.9	11	54.00	39	40.7	24	9.57	27	60.6	15
26.6	38.05	26	43.8	32	48.12	21	64.0	11	54.39	33	43.1	24	9.84	23	62.1	15
Nov. 5.5	38.31	11	47.0	33	48.33	18	65.1	10	54.72	27	45.5	26	10.07	19	63.6	14
15.5	38.42	4	50.3	34	48.51	14	66.1	9	54.99	20	48.1	25	10.26	16	65.0	14
25.5	38.38	19	53.7	33	48.65	10	67.0	9	55.19	13	50.6	25	10.42	11	66.4	14
Dec. 5.5	38.19	34	57.0	31	48.75	6	67.9	7	55.32	5	53.1	24	10.53	6	67.8	12
15.4	37.85	47	60.1	27	48.81	1	68.6	7	55.37	3	55.5	22	10.59	2	69.0	11
25.4	37.38	60	62.8	24	48.82	3	69.3	5	55.34	10	57.7	19	10.61	3	70.1	9
35.4	36.78		65.2		48.79		69.8		55.24		59.6		10.58		71.0	
Sec δ, Tan δ	3.742		−3.606		1.175		+0.616		2.054		+1.794		1.301		+0.832	
Mean Place	$33^{s}.408$		$69''.93$		$43^{s}.339$		$44''.70$		$47^{s}.651$		$28''.86$		$4^{s}.728$		$44''.48$	
$D'_{\psi}a$, $D_{\omega}a$	−0.08		+0.13		+0.01		−0.02		+0.04		−0.06		+0.02		−0.03	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ξ Persei. Mag. 4.0				γ Eridani. Mag. 3.2				λ Tauri. Var. 3.3–4.2				δ Reticuli. Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 3 53 s		° ′ +35 32 ″		h m 3 54 s		° ′ −13 44 ″		h m 3 55 s		° ′ +12 14 ″		h m 3 57 s		° ′ −61 37 ″	
Jan. 0.4	24.22		54.7		2.34		65.5		56.09		62.6		25.55		97.2	
10.4	24.17	5	55.4	7	2.28	6	66.9	14	56.05	4	62.2	4	25.25	30	99.4	22
20.3	24.07	10	55.9	5	2.19	9	68.1	12	55.98	7	61.8	4	24.89	36	101.1	17
30.3	23.93	14	56.1	2	2.06	13	69.1	10	55.87	11	61.4	4	24.49	40	102.3	12
Feb. 9.3	23.77	16	56.1	0	1.92	14	69.8	7	55.74	13	61.1	3	24.05	44	102.9	6
19.3	23.59	18	55.9	2	1.76	16	70.1	3	55.59	15	60.7	4	23.60	45	102.9	0
Mar. 1.2	23.39	20	55.5	4	1.59	17	70.2	1	55.43	16	60.4	3	23.14	46	102.4	5
11.2	23.20	19	54.8	7	1.42	17	70.0	2	55.28	15	60.1	3	22.69	45	101.4	10
21.2	23.03	17	54.0	8	1.26	16	69.5	5	55.14	14	59.9	2	22.27	42	99.8	16
31.1	22.88	15	53.1	9	1.13	13	68.7	8	55.01	13	59.8	1	21.88	39	97.8	20
Apr. 10.1	22.78	10	52.1	10	1.03	10	67.6	11	54.92	9	59.7	1	21.55	33	95.3	25
20.1	22.72	6	51.0	11	0.96	7	66.3	13	54.87	5	59.8	1	21.28	27	92.5	28
30.1	22.70	2	50.0	10	0.93	3	64.7	16	54.86	1	60.0	2	21.07	21	89.4	31
May 10.0	22.75	5	49.1	9	0.95	2	62.9	18	54.89	3	60.4	4	20.95	12	86.0	34
20.0	22.85	10	48.3	8	1.01	6	60.8	21	54.97	8	61.0	6	20.91	4	82.5	35
30.0	23.00	15	47.7	6	1.12	11	58.7	21	55.10	13	61.7	7	20.95	4	78.9	36
June 8.9	23.21	21	47.2	5	1.27	15	56.4	23	55.27	17	62.6	9	21.07	12	75.3	36
18.9	23.46	25	47.0	2	1.46	19	54.1	23	55.48	21	63.6	10	21.27	20	71.8	35
28.9	23.75	29	47.0	0	1.68	22	51.8	23	55.72	24	64.8	12	21.54	27	68.5	33
July 8.9	24.07	32	47.2	2	1.94	26	49.6	22	55.99	27	66.0	12	21.88	34	65.5	30
18.8	24.42	35	47.6	4	2.21	27	47.5	21	56.29	30	67.3	13	22.28	40	62.8	27
28.8	24.79	37	48.2	6	2.51	30	45.6	19	56.59	30	68.6	13	22.72	44	60.5	23
Aug. 7.8	25.16	37	49.0	8	2.81	30	43.9	17	56.91	32	69.9	13	23.19	47	58.8	17
17.8	25.54	38	49.9	9	3.12	31	42.5	14	57.23	32	71.1	12	23.69	50	57.6	12
27.7	25.91	37	51.0	11	3.42	30	41.5	10	57.54	31	72.2	11	24.19	50	57.0	6
Sept. 6.7	26.27	36	52.1	11	3.72	30	40.9	6	57.85	31	73.1	9	24.69	50	57.0	0
16.7	26.62	35	53.3	12	4.00	28	40.7	2	58.14	29	73.9	8	25.17	48	57.7	7
26.6	26.95	33	54.6	13	4.27	27	40.9	2	58.42	28	74.5	6	25.61	44	59.0	13
Oct. 6.6	27.26	31	55.9	13	4.51	24	41.5	6	58.68	26	74.9	4	26.01	40	60.9	19
16.6	27.54	28	57.1	12	4.74	23	42.4	9	58.92	24	75.1	2	26.36	35	63.2	23
26.6	27.80	26	58.4	13	4.93	19	43.6	12	59.13	21	75.2	1	26.64	28	66.0	28
Nov. 5.5	28.02	22	59.6	12	5.10	17	45.1	15	59.32	19	75.1	1	26.84	20	69.1	31
15.5	28.21	19	60.8	12	5.24	14	46.8	17	59.48	16	74.9	2	26.97	13	72.4	33
25.5	28.36	15	62.0	12	5.35	11	48.6	18	59.61	13	74.6	3	27.02	5	75.8	34
Dec. 5.5	28.47	11	63.1	11	5.42	7	50.5	19	59.70	9	74.2	4	26.99	3	79.1	33
15.4	28.54	7	64.1	10	5.45	3	52.3	18	59.76	6	73.8	4	26.87	12	82.3	32
25.4	28.56	2	64.9	8	5.45	0	54.0	17	59.78	2	73.4	4	26.68	19	85.2	29
35.4	28.53	3	65.7	8	5.41	4	55.6	16	59.76	2	73.0	4	26.42	26	87.7	25
Sec δ, Tan δ	1.229		+0.715		1.029		−0.245		1.023		+0.217		2.105		−1.851	
Mean Place	22ˢ.869		40″.18		0ˢ.994		68″.99		54ˢ.838		53″.24		22ˢ.745		93″.02	
D′ψα, Dωα	+0.02		−0.03		−0.01		+0.01		0.00		−0.01		−0.04		+0.06	
Dψδ, Dωδ	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*ν* Tauri. Mag. 3.9				**A Tauri.** Mag. 4.5				*c* Persei. Mag. 4.0				*p* Tauri. Mag. 5.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 58		+ 5 45		3 59		+21 50		4 2		+47 29		4 5		+26 15	
	s		″		s		″		s		″		s		″	
Jan. 0.4	36.08		13.1		37.80		63.5		26.41		18.5		36.78		38.8	
10.4	36.04	4	12.4	7	37.76	4	63.6	1	26.34	7	19.7	12	36.74	4	39.0	2
20.3	35.97	7	11.8	6	37.68	8	63.5	1	26.21	13	20.7	10	36.67	7	39.2	2
30.3	35.86	11	11.2	6	37.58	10	63.4	1	26.04	17	21.4	7	36.55	12	39.2	0
Feb. 9.3	35.73	13	10.8	4	37.44	14	63.2	2	25.84	20	21.7	3	36.41	14	39.1	1
		15		4		16		3		23		0		16		2
19.3	35.58		10.4		37.28		62.9		25.61		21.7		36.25		38.9	
Mar. 1.2	35.43	15	10.1	3	37.12	16	62.5	4	25.36	25	21.3	4	36.08	17	38.6	3
11.2	35.27	16	9.9	2	36.95	17	62.1	4	25.12	24	20.6	7	35.91	17	38.1	5
21.2	35.13	14	9.9	0	36.80	15	61.6	5	24.90	22	19.7	9	35.75	16	37.6	5
31.1	35.01	12	10.0	1	36.67	13	61.2	4	24.71	19	18.5	12	35.61	14	37.0	6
		9		2		10		5		14		14		11		6
Apr. 10.1	34.92		10.2		36.57		60.7		24.57		17.1		35.50		36.4	
20.1	34.86	6	10.6	4	36.52	5	60.4	3	24.47	10	15.6	15	35.44	6	35.8	6
30.1	34.84	2	11.2	6	36.51	1	60.1	3	24.44	3	14.0	16	35.42	2	35.3	5
May 10.0	34.87	3	12.0	8	36.54	3	59.9	2	24.47	3	12.4	16	35.45	3	34.9	4
20.0	34.94	7	12.9	9	36.63	9	59.9	0	24.57	10	11.0	14	35.53	8	34.6	3
		12		11		13		1		17		14		13		2
30.0	35.06		14.0		36.76		60.0		24.74		9.6		35.66		34.4	
June 9.0	35.23	17	15.3	13	36.94	18	60.4	4	24.96	22	8.4	12	35.84	18	34.5	1
18.9	35.43	20	16.6	13	37.16	22	60.8	4	25.24	28	7.5	9	36.06	22	34.7	2
28.9	35.66	23	18.1	15	37.41	25	61.5	7	25.57	33	6.9	6	36.32	26	35.1	4
July 8.9	35.92	26	19.6	15	37.69	28	62.3	8	25.94	37	6.5	4	36.61	29	35.6	5
		28		15		31		9		39		2		31		7
18.8	36.20		21.1		38.00		63.2		26.33		6.3		36.92		36.3	
28.8	36.50	30	22.6	15	38.32	32	64.2	10	26.75	42	6.5	2	37.25	33	37.1	8
Aug. 7.8	36.81	31	23.9	13	38.65	33	65.2	10	27.19	44	6.9	4	37.59	34	38.0	9
17.8	37.12	31	25.1	12	38.99	34	66.3	11	27.63	44	7.5	6	37.93	34	38.9	9
27.7	37.42	30	26.2	11	39.32	33	67.3	10	28.07	44	8.4	9	38.27	34	39.9	10
		30		9		32		10		43		11		34		10
Sept. 6.7	37.72		27.1		39.64		68.3		28.50		9.5		38.61		40.9	
16.7	38.01	29	27.7	6	39.95	31	69.2	9	28.92	42	10.7	12	38.93	32	41.9	10
26.7	38.28	27	28.1	4	40.25	30	70.1	9	29.32	40	12.1	14	39.24	31	42.8	9
Oct. 6.6	38.54	26	28.3	2	40.53	28	70.8	7	29.69	37	13.7	16	39.53	29	43.7	9
16.6	38.77	23	28.2	1	40.78	25	71.5	7	30.03	34	15.4	17	39.80	27	44.5	8
		21		3		23		5		31		17		25		7
26.6	38.98		27.9		41.01		72.0		30.34		17.1		40.05		45.2	
Nov. 5.5	39.17	19	27.5	4	41.22	21	72.5	5	30.62	28	18.9	18	40.27	22	45.8	6
15.5	39.32	15	26.9	6	41.39	17	72.8	3	30.85	23	20.7	18	40.45	18	46.4	6
25.5	39.45	13	26.2	7	41.53	14	73.1	3	31.04	19	22.5	18	40.60	15	47.0	6
Dec. 5.5	39.54	9	25.4	8	41.64	11	73.3	2	31.17	13	24.3	18	40.72	12	47.5	5
		6		8		7		2		8		17		8		4
15.4	39.60		24.6		41.71		73.5		31.25		26.0		40.80		47.9	
25.4	39.62	2	23.8	8	41.73	2	73.6	1	31.27	2	27.5	15	40.83	3	48.2	3
35.4	39.60	2	23.0	8	41.72	1	73.6	0	31.23	4	28.9	14	40.82	1	48.5	3
Sec δ, Tan δ	1.005		+0.101		1.077		+0.401		1.480		+1.091		1.115		+0.493	
Mean Place	$34^{s}.812$		$5''.16$		$36^{s}.509$		$51''.99$		$24^{s}.803$		$1''.99$		$35^{s}.430$		$26''.43$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		0.00		+0.01		−0.01		+0.03		−0.04		+0.01		−0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	o^1 **Eridani.** Mag. 4.1				μ **Tauri.** Mag. 4.3				α **Horologii.** Mag. 3.8				α **Reticuli.** Mag. 3.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 7		− 7 3		4 10		+ 8 40		4 11		−42 29		4 13		−62 40	
	s		″		s		″		s		″		s		″	
Jan. 0.4	41.36		34.6		53.10		48.5		10.98		83.5		21.73		83.2	
10.4	41.31	5	35.8	12	53.07	3	48.0	5	10.85	13	85.8	23	21.43	30	85.6	24
20.3	41.23	8	36.9	11	53.00	7	47.4	6	10.68	17	87.6	18	21.07	36	87.5	19
30.3	41.12	11	37.8	9	52.90	10	46.9	5	10.47	21	89.0	14	20.66	41	88.9	14
Feb. 9.3	40.99	13	38.4	6	52.77	13	46.5	4	10.24	23	89.9	9	20.21	45	89.7	8
19.3	40.83	16	38.8	4	52.62	15	46.1	4	9.98	26	90.3	4	19.74	47	90.0	3
Mar. 1.2	40.67	16	39.0	2	52.47	15	45.9	2	9.71	27	90.3	0	19.25	49	89.7	3
11.2	40.51	16	39.0	0	52.31	16	45.7	2	9.45	26	89.7	6	18.77	48	88.9	8
21.2	40.35	16	38.7	3	52.16	15	45.5	2	9.20	25	88.6	11	18.31	46	87.5	14
31.2	40.22	13	38.2	5	52.03	13	45.5	0	8.97	23	87.1	15	17.89	42	85.7	18
Apr. 10.1	40.11	11	37.4	8	51.93	10	45.6	1	8.78	19	85.2	19	17.52	37	83.4	23
20.1	40.04	7	36.4	10	51.86	7	45.9	3	8.63	15	82.9	23	17.20	32	80.7	27
30.1	40.01	3	35.2	12	51.84	2	46.3	4	8.52	11	80.3	26	16.96	24	77.7	30
May 10.0	40.02	1	33.8	14	51.86	2	46.9	6	8.47	5	77.4	29	16.80	16	74.5	32
20.0	40.07	5	32.2	16	51.92	6	47.6	7	8.47	0	74.4	30	16.71	9	71.0	35
30.0	40.17	10	30.4	18	52.03	11	48.5	9	8.53	6	71.2	32	16.72	1	67.5	35
June 9.0	40.32	15	28.5	19	52.18	15	49.5	10	8.64	11	67.9	33	16.80	8	63.9	36
18.9	40.50	18	26.5	20	52.38	20	50.7	12	8.81	17	64.6	33	16.97	17	60.4	35
28.9	40.72	22	24.5	20	52.61	23	52.0	13	9.02	21	61.5	31	17.22	25	57.0	34
July 8.9	40.96	24	22.5	20	52.86	25	53.3	13	9.28	26	58.5	30	17.54	32	53.9	31
18.9	41.23	27	20.6	19	53.14	28	54.7	14	9.57	29	55.8	27	17.92	38	51.1	28
28.8	41.52	29	18.8	18	53.44	30	56.0	13	9.89	32	53.5	23	18.36	44	48.7	24
Aug. 7.8	41.82	30	17.2	16	53.74	30	57.2	12	10.23	34	51.5	20	18.83	47	46.8	19
17.8	42.12	30	15.9	13	54.05	31	58.4	12	10.59	36	50.1	14	19.33	50	45.5	13
27.7	42.42	30	14.8	11	54.36	31	59.4	10	10.95	36	49.2	9	19.85	52	44.7	8
Sept. 6.7	42.72	30	14.1	7	54.67	31	60.3	9	11.30	35	48.9	3	20.36	51	44.6	1
16.7	43.00	28	13.7	4	54.96	29	60.9	6	11.64	34	49.1	2	20.86	50	45.1	5
26.7	43.27	27	13.7	0	55.24	28	61.4	5	11.97	33	49.9	8	21.33	47	46.2	11
Oct. 6.6	43.53	26	14.0	3	55.51	27	61.6	2	12.27	30	51.3	14	21.76	43	47.9	17
16.6	43.76	23	14.7	7	55.76	25	61.6	0	12.54	27	53.2	19	22.14	38	50.2	23
26.6	43.97	21	15.6	9	55.98	22	61.4	2	12.77	23	55.5	23	22.46	32	52.9	27
Nov. 5.6	44.16	19	16.8	12	56.18	20	61.1	3	12.97	20	58.2	27	22.70	24	56.0	31
15.5	44.31	15	18.1	13	56.35	17	60.6	5	13.11	14	61.1	29	22.86	16	59.3	33
25.5	44.43	12	19.6	15	56.49	14	60.0	6	13.21	10	64.2	31	22.94	8	62.7	34
Dec. 5.5	44.52	9	21.1	15	56.60	11	59.4	6	13.26	5	67.3	31	22.93	1	66.1	34
15.4	44.58	6	22.7	16	56.67	7	58.8	6	13.26	0	70.2	29	22.84	9	69.4	33
25.4	44.60	2	24.1	14	56.70	3	58.1	7	13.21	5	73.0	28	22.66	18	72.4	30
35.4	44.58	2	25.5	14	56.69	1	57.5	6	13.11	10	75.5	25	22.41	25	75.1	27
Sec δ, Tan δ	1.008		−0.124		1.012		+0.153		1.356		−0.916		2.179		−1.936	
Mean Place	40ˢ.007		39″.80		51ˢ.777		39″.92		9ˢ.109		82″.50		18ˢ.776		80″.12	
D′ψ α, Dω α	0.00		0.00		0.00		0.00		−0.02		+0.03		−0.05		+0.06	
Dψ δ, Dω δ	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ **Tauri.** Mag. 3.9				δ **Tauri.** Mag. 3.9				υ^5 **Eridani.** Mag. 4.1				ϵ **Tauri.** Mag. 3.6		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli tion
	h m 4 14 s		° ′ +15 25 ″		h m 4 17 s		° ′ +17 20 ″		h m 4 20 s		° ′ −34 12 ″		h m 4 23 s		° +18 ″
Jan. 0.4	55.19		24.8		59.74		40.3		50.08		57.2		36.98		36.6
10.4	55.16	3	24.5	3	59.72	2	40.1	2	49.99	9	59.4	22	36.96	2	36.5
20.3	55.09	7	24.3	2	59.66	6	39.9	2	49.86	13	61.2	18	36.90	6	36.4
30.3	54.99	10	24.0	3	59.56	10	39.7	2	49.70	16	62.6	14	36.80	10	36.2
Feb. 9.3	54.87	12	23.7	3	59.43	13	39.5	2	49.50	20	63.6	10	36.67	13	36.0
19.3	54.72	15	23.4	3	59.28	15	39.2	3	49.29	21	64.1	5	36.52	15	35.8
Mar. 1.2	54.56	16	23.1	3	59.12	16	38.9	3	49.06	23	64.2	1	36.36	16	35.5
11.2	54.40	16	22.8	3	58.96	16	38.6	3	48.83	23	63.9	3	36.20	16	35.2
21.2	54.25	15	22.5	3	58.80	16	38.3	3	48.61	22	63.1	8	36.04	16	34.9
31.2	54.11	14	22.3	2	58.67	13	38.0	3	48.42	19	61.9	12	35.90	14	34.6
Apr. 10.1	54.01	10	22.2	1	58.56	11	37.8	2	48.25	17	60.3	16	35.78	12	34.3
20.1	53.94	7	22.1	1	58.49	7	37.7	1	48.11	14	58.3	20	35.71	7	34.1
30.1	53.91	3	22.2	1	58.46	3	37.6	1	48.02	9	56.0	23	35.68	3	34.0
May 10.0	53.93	2	22.4	2	58.47	1	37.7	1	47.98	4	53.4	26	35.69	1	34.0
20.0	54.00	7	22.7	3	58.54	7	37.9	2	47.99	1	50.6	28	35.75	6	34.1
30.0	54.11	11	23.2	5	58.65	11	38.2	3	48.05	6	47.7	29	35.85	10	34.3
June 9.0	54.26	15	23.8	6	58.80	15	38.7	5	48.16	11	44.7	30	36.00	15	34.7
18.9	54.46	20	24.6	8	59.00	20	39.4	7	48.31	15	41.7	30	36.20	20	35.2
28.9	54.69	23	25.4	8	59.24	24	40.2	8	48.51	20	38.7	30	36.43	23	35.9
July 8.9	54.95	26	26.4	10	59.50	26	41.1	9	48.75	24	35.8	29	36.69	26	36.7
18.9	55.24	29	27.5	11	59.79	29	42.0	9	49.02	27	33.2	26	36.98	29	37.5
28.8	55.55	31	28.6	11	60.09	30	43.1	11	49.32	30	30.9	23	37.28	30	38.5
Aug. 7.8	55.86	31	29.7	11	60.41	32	44.1	10	49.63	31	28.9	20	37.60	32	39.4
17.8	56.18	32	30.7	10	60.73	32	45.1	10	49.96	33	27.4	15	37.92	32	40.3
27.7	56.50	32	31.7	10	61.05	32	46.0	9	50.29	33	26.4	10	38.25	33	41.2
Sept. 6.7	56.81	31	32.6	9	61.37	32	46.9	9	50.62	33	25.9	5	38.57	32	42.1
16.7	57.12	31	33.3	7	61.68	31	47.6	7	50.94	32	25.9	0	38.89	32	42.8
26.7	57.41	29	33.9	6	61.98	30	48.3	7	51.25	31	26.5	6	39.19	30	43.4
Oct. 6.6	57.69	28	34.4	5	62.26	28	48.7	4	51.53	28	27.6	11	39.48	29	43.9
16.6	57.95	26	34.7	3	62.52	26	49.1	4	51.79	26	29.2	16	39.75	27	44.3
26.6	58.18	23	34.8	1	62.76	24	49.3	2	52.02	23	31.3	21	40.00	25	44.6
Nov. 5.6	58.39	21	34.8	0	62.98	22	49.4	1	52.22	20	33.7	24	40.22	22	44.8
15.5	58.57	18	34.7	1	63.17	19	49.4	0	52.38	16	36.3	26	40.41	19	44.9
25.5	58.72	15	34.6	1	63.32	15	49.4	0	52.49	11	39.1	28	40.57	16	44.9
Dec. 5.5	58.84	12	34.4	2	63.44	12	49.3	1	52.57	8	41.9	28	40.70	13	44.9
15.4	58.92	8	34.1	3	63.52	8	49.1	2	52.60	3	44.7	28	40.79	9	44.8
25.4	58.96	4	33.8	3	63.57	5	48.9	2	52.58	2	47.3	26	40.84	5	44.7
35.4	58.95	1	33.5	3	63.57	0	48.7	2	52.52	6	49.7	24	40.85	1	44.6
Sec δ, Tan δ	1.037		+0.276		1.048		+0.312		1.209		−0.680		1.058		+0.344
Mean Place	$53^{s}.842$		14″.79		$58^{s}.384$		29″.92		$48^{s}.380$		57″.91		$35^{s}.584$		25″.99
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.01		−0.01		+0.01		−0.01		−0.02		+0.02		+0.01		−0.01
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**δ Mensæ.** Mag. 5.6				**m Persei.** Mag. 6.1				**α Tauri.** Mag. 1.1				**ν Eridani.** Mag. 4.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 4 23 s		° ′ −80 24 ″		h m 4 27 s		° ′ +42 52 ″		h m 4 30 s		° ′ +16 20 ″		h m 4 32 s		° ′ − 3 31 ″	
Jan. 0.4	53.31	101	61.5	24	23.30	4	67.1	11	60.45	1	24.1	2	2.65	2	32.6	12
10.4	52.30	118	63.9	18	23.26	8	68.2	9	60.44	6	23.9	3	2.63	6	33.8	10
20.4	51.12	132	65.7	14	23.18	14	69.1	7	60.38	9	23.6	2	2.57	10	34.8	9
30.3	49.80	142	67.1	8	23.04	17	69.8	5	60.29	12	23.4	2	2.47	12	35.7	7
Feb. 9.3	48.38	148	67.9	3	22.87	20	70.3	1	60.17	15	23.2	3	2.35	15	36.4	5
19.3	46.90	149	68.2	3	22.67	22	70.4	1	60.02	16	22.9	3	2.20	16	36.9	3
Mar. 1.2	45.41	148	67.9	8	22.45	23	70.3	5	59.86	16	22.6	2	2.04	17	37.2	1
11.2	43.93	142	67.1	14	22.22	21	69.8	7	59.70	16	22.4	3	1.87	16	37.3	2
21.2	42.51	134	65.7	19	22.01	19	69.1	9	59.54	14	22.1	2	1.71	14	37.1	3
31.2	41.17	121	63.8	22	21.82	15	68.2	11	59.40	12	21.9	2	1.57	12	36.8	6
Apr. 10.1	39.96	106	61.6	26	21.67	11	67.1	12	59.28	8	21.7	0	1.45	9	36.2	7
20.1	38.90	89	59.0	30	21.56	5	65.9	13	59.20	4	21.7	0	1.36	5	35.5	10
30.1	38.01	69	56.0	32	21.51	0	64.6	13	59.16	0	21.7	1	1.31	1	34.5	12
May 10.1	37.32	49	52.8	34	21.51	7	63.3	12	59.16	5	21.8	2	1.30	4	33.3	13
20.0	36.83	27	49.4	35	21.58	12	62.1	12	59.21	10	22.0	4	1.34	8	32.0	15
30.0	36.56	4	45.9	35	21.70	18	60.9	10	59.31	14	22.4	5	1.42	12	30.5	17
June 9.0	36.52	18	42.4	34	21.88	24	59.9	8	59.45	19	22.9	7	1.54	17	28.8	17
18.9	36.70	40	39.0	32	22.12	28	59.1	6	59.64	22	23.6	7	1.71	20	27.1	18
28.9	37.10	60	35.8	30	22.40	32	58.5	5	59.86	25	24.3	9	1.91	23	25.3	18
July 8.9	37.70	79	32.8	27	22.72	36	58.0	2	60.11	28	25.2	9	2.14	25	23.5	18
18.9	38.49	95	30.1	24	23.08	38	57.8	0	60.39	29	26.1	10	2.39	28	21.7	16
28.8	39.44	109	27.7	18	23.46	39	57.8	3	60.68	31	27.1	10	2.67	29	20.1	15
Aug. 7.8	40.53	119	25.9	13	23.85	41	58.1	4	60.99	32	28.1	9	2.96	30	18.6	13
17.8	41.72	125	24.6	6	24.26	41	58.5	6	61.31	32	29.0	9	3.26	30	17.3	10
27.8	42.97	128	24.0	1	24.67	41	59.1	8	61.63	32	29.9	7	3.56	30	16.3	7
Sept. 6.7	44.25	126	23.9	5	25.08	40	59.9	9	61.95	31	30.6	7	3.86	29	15.6	4
16.7	45.51	119	24.4	12	25.48	39	60.8	11	62.26	30	31.3	5	4.15	28	15.2	1
26.7	46.70	108	25.6	18	25.87	36	61.9	11	62.56	29	31.8	4	4.43	27	15.1	2
Oct. 6.6	47.78	94	27.4	22	26.23	35	63.0	13	62.85	27	32.2	2	4.70	25	15.3	5
16.6	48.72	76	29.6	27	26.58	32	64.3	13	63.12	25	32.4	1	4.95	23	15.8	8
26.6	49.48	54	32.3	31	26.90	28	65.6	14	63.37	22	32.5	0	5.18	21	16.6	11
Nov. 5.6	50.02	31	35.4	33	27.18	25	67.0	14	63.59	20	32.5	1	5.39	18	17.7	12
15.5	50.33	6	38.7	34	27.43	21	68.4	15	63.79	17	32.4	2	5.57	15	18.9	14
25.5	50.39	19	42.1	33	27.64	17	69.9	14	63.96	13	32.2	2	5.72	11	20.3	14
Dec. 5.5	50.20	44	45.4	33	27.81	11	71.3	14	64.09	10	32.0	2	5.83	8	21.7	14
15.5	49.76	68	48.7	30	27.92	6	72.7	13	64.19	5	31.8	3	5.91	5	23.1	14
25.4	49.08	89	51.7	26	27.98	0	74.0	12	64.24	2	31.5	3	5.96	0	24.5	13
35.4	48.19		54.3		27.98		75.2		64.26		31.2		5.96		25.8	
Sec δ, Tan δ	6.004		−5.920		1.365		+0.929		1.042		+0.293		1.002		−0.062	
Mean Place	45ˢ.420		58″.57		21ˢ.611		52″.36		59ˢ.038		14″.12		1ˢ.244		38″.92	
D′ψα, Dωα	−0.14		+0.16		+0.02		−0.02		+0.01		−0.01		0.00		0.00	
Dψδ, Dωδ	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.1		+0.9	

Mean Solar Date.	*α* Doradus. Mag. 3.5				53 Eridani. Mag. 4.0				*τ* Tauri. Mag. 4.3				Groombridge 848. Mag. 6.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 32		−55 12		4 34		−14 27		4 37		+22 47		4 37		+75 47	
	s		″		s		″		s		″		s		″	
Jan. 0.4	10.67		82.4		15.88		72.5		6.37		45.2		18.94		29.3	
10.4	10.48	19	85.0	26	15.85	3	74.2	17	6.36	1	45.3	1	18.70	24	31.9	26
20.4	10.23	25	87.2	22	15.78	7	75.6	14	6.31	5	45.4	1	18.30	40	34.1	22
30.3	9.94	29	88.9	17	15.67	11	76.8	12	6.22	9	45.4	0	17.77	53	36.0	19
Feb. 9.3	9.61	33	90.0	11	15.53	14	77.7	9	6.09	13	45.3	1	17.12	65	37.4	14
19.3	9.25	36	90.6	6	15.37	16	78.3	6	5.94	15	45.2	1	16.39	73	38.2	8
Mar. 1.3	8.87	38	90.7	1	15.20	17	78.6	3	5.77	17	45.0	2	15.62	77	38.4	2
11.2	8.49	38	90.2	5	15.02	18	78.5	1	5.60	17	44.7	3	14.84	78	38.1	3
21.2	8.13	36	89.2	10	14.84	18	78.2	3	5.43	17	44.4	3	14.09	75	37.3	8
31.2	7.79	34	87.7	15	14.69	15	77.6	6	5.28	15	44.0	4	13.41	68	36.0	13
Apr. 10.1	7.48	31	85.8	19	14.55	14	76.7	9	5.16	12	43.6	4	12.83	58	34.2	18
20.1	7.22	26	83.4	24	14.45	10	75.5	12	5.07	9	43.2	4	12.37	46	32.0	22
30.1	7.02	20	80.7	27	14.39	6	74.1	14	5.03	4	42.9	3	12.05	32	29.6	24
May 10.1	6.88	14	77.7	30	14.37	2	72.4	17	5.03	0	42.7	2	11.90	15	27.0	26
20.0	6.81	7	74.5	32	14.39	2	70.5	19	5.07	4	42.6	1	11.91	1	24.3	27
30.0	6.81	0	71.1	34	14.46	7	68.4	21	5.17	10	42.5	1	12.09	18	21.6	27
June 9.0	6.88	7	67.6	35	14.57	11	66.2	22	5.31	14	42.7	2	12.43	34	19.0	26
19.0	7.01	13	64.1	35	14.72	15	64.0	22	5.50	19	42.9	2	12.93	50	16.6	24
28.9	7.21	20	60.7	34	14.91	19	61.7	23	5.72	22	43.3	4	13.57	64	14.4	22
July 8.9	7.47	26	57.6	31	15.14	23	59.5	22	5.98	26	43.8	5	14.34	77	12.5	19
18.9	7.78	31	54.7	29	15.39	25	57.3	22	6.27	29	44.4	6	15.21	87	10.9	16
28.8	8.13	35	52.1	26	15.66	27	55.4	19	6.58	31	45.1	7	16.16	95	9.7	12
Aug. 7.8	8.52	39	50.0	21	15.95	29	53.7	17	6.89	31	45.9	8	17.18	102	8.9	8
17.8	8.93	41	48.4	16	16.24	29	52.2	15	7.22	33	46.7	8	18.26	108	8.5	4
27.8	9.36	43	47.4	10	16.54	30	51.2	10	7.56	34	47.4	7	19.36	110	8.6	1
Sept. 6.7	9.79	43	47.0	4	16.85	31	50.5	7	7.89	33	48.1	7	20.46	110	9.0	4
16.7	10.22	43	47.2	2	17.14	29	50.2	3	8.21	32	48.8	7	21.56	110	9.9	9
26.7	10.63	41	48.1	9	17.42	28	50.3	1	8.53	32	49.4	6	22.63	107	11.1	12
Oct. 6.7	11.01	38	49.5	14	17.69	27	50.9	6	8.83	30	50.0	6	23.65	102	12.7	16
16.6	11.35	34	51.5	20	17.95	26	51.8	9	9.12	29	50.4	4	24.60	95	14.7	20
26.6	11.65	30	54.0	25	18.18	23	53.1	13	9.39	27	50.8	4	25.47	87	17.0	23
Nov. 5.6	11.89	24	56.9	29	18.38	20	54.7	16	9.63	24	51.1	3	26.23	76	19.6	26
15.5	12.08	19	60.1	32	18.56	18	56.5	18	9.84	21	51.3	2	26.88	65	22.4	28
25.5	12.20	12	63.4	33	18.70	14	58.4	19	10.02	18	51.5	2	27.39	51	25.3	29
Dec. 5.5	12.25	5	66.8	34	18.81	11	60.4	20	10.17	15	51.7	2	27.75	36	28.3	30
15.5	12.23	2	70.2	34	18.88	7	62.5	21	10.27	10	51.8	1	27.95	20	31.3	30
25.4	12.15	8	73.3	31	18.91	3	64.4	19	10.34	7	51.9	1	27.97	2	34.2	29
35.4	12.00	15	76.2	29	18.90	1	66.2	18	10.36	2	52.0	1	27.83	14	36.9	27
Sec *δ*, Tan *δ*	1.753		−1.440		1.033		−0.258		1.085		+0.420		4.074		+3.949	
Mean Place	8ˢ.225		81″.32		14ˢ.410		76″.92		4ˢ.896		34″.14		14ˢ.302		11″.40	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.03		+0.03		−0.01		+0.01		+0.01		−0.01		+0.10		−0.09	
$D_\psi \delta$, $D_\omega \delta$	+0.1		+0.9		+0.1		+0.9		+0.1		+0.9		+0.1		+0.9	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Coeli. Mag. 4.5				4 Camelop. Mag. 5.4				μ Eridani. Mag. 4.2				π³ Orionis. Mag. 3.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 37		−42 1		4 40		+56 36		4 41		− 3 24		4 45		+ 6 48	
	s		″		s		″		s		″		s		″	
Jan. 0.4	49.25		39.5		52.31		36.4		13.53		34.9		11.65		51.6	
10.4	49.15	10	42.0	25	52.26	5	38.2	18	13.51	2	36.1	12	11.65	0	50.9	7
20.4	49.00	15	44.1	21	52.14	12	39.7	15	13.46	5	37.2	11	11.60	5	50.2	7
30.3	48.81	19	45.8	17	51.95	19	41.0	13	13.37	9	38.1	9	11.52	8	49.6	6
Feb. 9.3	48.58	23	47.0	12	51.71	24	41.9	9	13.25	12	38.8	7	11.41	11	49.2	4
19.3	48.33	25	47.7	7	51.43	28	42.4	5	13.10	15	39.3	5	11.27	14	48.8	4
Mar. 1.3	48.06	27	48.0	3	51.12	31	42.6	2	12.94	16	39.6	3	11.11	16	48.5	3
11.2	47.79	27	47.7	3	50.80	32	42.3	3	12.77	17	39.7	1	10.95	16	48.3	2
21.2	47.53	26	46.9	8	50.50	30	41.6	7	12.61	16	39.6	1	10.79	16	48.3	0
31.2	47.29	24	45.7	12	50.22	28	40.5	11	12.46	15	39.3	3	10.64	15	48.3	0
Apr. 10.1	47.07	22	44.1	16	49.99	23	39.1	14	12.34	12	38.8	5	10.52	12	48.5	2
20.1	46.89	18	42.1	20	49.81	18	37.5	16	12.24	10	38.0	8	10.43	9	48.8	3
30.1	46.76	13	39.7	24	49.70	11	35.7	18	12.18	6	37.1	9	10.38	5	49.3	5
May 10.1	46.68	8	37.0	27	49.67	3	33.8	19	12.17	1	36.0	11	10.37	1	49.9	6
20.0	46.65	3	34.1	29	49.71	4	31.8	20	12.20	3	34.7	13	10.40	3	50.6	7
30.0	46.67	2	31.0	31	49.84	13	29.9	19	12.27	7	33.2	15	10.48	8	51.5	9
June 9.0	46.75	8	27.8	32	50.04	20	28.1	18	12.38	11	31.6	16	10.60	12	52.5	10
19.0	46.88	13	24.5	33	50.30	26	26.5	16	12.54	16	29.9	17	10.76	16	53.7	12
28.9	47.06	18	21.3	32	50.63	33	25.1	14	12.73	19	28.1	18	10.96	20	54.9	12
July 8.9	47.29	23	18.3	30	51.02	39	23.9	12	12.96	23	26.3	18	11.19	23	56.2	13
18.9	47.56	27	15.5	28	51.46	44	23.0	9	13.21	25	24.6	17	11.45	26	57.5	13
28.8	47.86	30	13.0	25	51.93	47	22.4	6	13.48	27	23.0	16	11.73	28	58.8	13
Aug. 7.8	48.18	32	10.9	21	52.43	50	22.0	4	13.77	29	21.5	15	12.02	29	59.9	11
17.8	48.52	34	9.3	16	52.95	52	22.0	0	14.06	29	20.3	12	12.32	30	61.0	11
27.8	48.87	35	8.2	11	53.47	52	22.2	2	14.36	30	19.3	10	12.63	31	61.9	9
Sept. 6.7	49.22	35	7.6	6	54.00	53	22.8	6	14.66	30	18.5	8	12.93	30	62.6	7
16.7	49.57	35	7.6	0	54.52	52	23.6	8	14.95	29	18.1	4	13.23	30	63.1	5
26.7	49.91	34	8.3	7	55.03	51	24.6	10	15.24	29	18.0	1	13.53	30	63.4	3
Oct. 6.7	50.23	32	9.5	12	55.52	49	25.9	13	15.51	27	18.3	3	13.81	28	63.4	0
16.6	50.52	29	11.2	17	55.98	46	27.4	15	15.77	26	18.8	5	14.08	27	63.2	2
26.6	50.78	26	13.4	22	56.41	43	29.1	17	16.01	24	19.6	8	14.33	25	62.8	4
Nov. 5.6	51.00	22	16.0	26	56.79	38	31.0	19	16.22	21	20.7	11	14.55	22	62.3	5
15.5	51.18	18	18.8	28	57.13	34	33.0	20	16.41	19	21.9	12	14.75	20	61.6	7
25.5	51.31	13	21.9	31	57.41	28	35.1	21	16.57	16	23.3	14	14.93	18	60.8	8
Dec. 5.5	51.40	9	25.0	31	57.62	21	37.2	21	16.69	12	24.7	14	15.07	14	59.9	9
15.5	51.43	3	28.1	31	57.77	15	39.4	22	16.78	9	26.2	15	15.17	10	59.0	9
25.4	51.41	2	31.1	30	57.84	7	41.4	20	16.83	5	27.6	14	15.23	6	58.2	8
35.4	51.33	8	33.8	27	57.84	0	43.3	19	16.84	1	28.9	13	15.25	2	57.4	8
Sec δ, Tan δ	1.346		−0.901		1.817		+1.517		1.002		−0.060		1.007		+0.119	
Mean Place	$47^{s}.335$		$40''.07$		$50^{s}.049$		$20''.45$		$12^{s}.095$		$41''.33$		$10^{s}.216$		$43''.41$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.02		+0.02		+0.04		−0.03		0.00		0.00		0.00		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+0.9		+0.1		+0.9		+0.1		+0.9		+0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**9 Camelop.** Mag. 4.4				**ι Tauri.** Mag. 5.1				**π^5 Orionis.** Mag. 3.9				**ι Aurigæ.** Mag. 2.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 4 45		° ′ +66 11		h m 4 46		° ′ +18 41		h m 4 49		° ′ + 2 18		h m 4 51		° ′ +33 1	
	s		″		s		″		s		″		s		″	
Jan. 0.4	32.62		69.7		21.97		49.9		47.71		10.1		25.09		63.5	
10.4	32.53	9	71.9	22	21.97	0	49.8	1	47.70	1	9.1	10	25.09	0	64.2	7
20.4	32.34	19	73.9	20	21.93	4	49.7	1	47.66	4	8.3	8	25.04	5	64.7	5
30.3	32.07	27	75.6	17	21.84	9	49.5	2	47.58	8	7.6	7	24.95	9	65.2	5
Feb. 9.3	31.72	35	76.8	12	21.72	12	49.4	1	47.46	12	7.0	6	24.82	13	65.5	3
19.3	31.31	41	77.6	8	21.58	14	49.2	2	47.32	14	6.5	5	24.65	17	65.6	1
Mar. 1.3	30.87	44	77.8	2	21.42	16	49.0	2	47.16	16	6.2	3	24.47	18	65.6	0
11.2	30.42	45	77.6	2	21.25	17	48.8	2	47.00	16	6.0	2	24.28	19	65.3	3
21.2	29.98	44	76.9	7	21.08	17	48.5	3	46.84	16	6.0	0	24.09	19	64.9	4
31.2	29.58	40	75.7	12	20.93	15	48.3	2	46.69	15	6.2	2	23.92	17	64.4	5
Apr. 10.2	29.24	34	74.2	15	20.81	12	48.1	2	46.56	13	6.5	3	23.77	15	63.7	7
20.1	28.97	27	72.3	19	20.72	9	47.9	2	46.46	10	7.0	5	23.66	11	63.0	7
30.1	28.79	18	70.2	21	20.66	6	47.8	1	46.40	6	7.7	7	23.59	7	62.2	8
May 10.1	28.71	8	68.0	22	20.65	1	47.8	0	46.38	2	8.5	8	23.58	1	61.5	7
20.0	28.73	2	65.6	24	20.69	4	47.9	1	46.41	3	9.5	10	23.61	3	60.8	7
30.0	28.86	13	63.3	23	20.78	9	48.1	2	46.48	7	10.6	11	23.70	9	60.1	7
June 9.0	29.09	23	61.1	22	20.91	13	48.4	3	46.59	11	11.9	13	23.84	14	59.6	5
19.0	29.41	32	59.0	21	21.08	17	48.8	4	46.75	16	13.3	14	24.03	19	59.2	4
28.9	29.82	41	57.1	19	21.29	21	49.4	6	46.94	19	14.7	14	24.26	23	58.9	3
July 8.9	30.31	49	55.5	16	21.53	24	50.1	7	47.16	22	16.2	15	24.53	27	58.8	1
18.9	30.87	56	54.1	14	21.80	27	50.8	7	47.41	25	17.7	15	24.83	30	58.8	0
28.9	31.47	60	53.1	10	22.10	30	51.6	8	47.68	27	19.1	14	25.16	33	59.0	2
Aug. 7.8	32.12	65	52.4	7	22.41	31	52.4	8	47.96	28	20.3	12	25.50	34	59.3	3
17.8	32.80	68	52.1	3	22.73	32	53.2	8	48.26	30	21.5	12	25.86	36	59.7	4
27.8	33.49	69	52.2	1	23.05	32	54.0	8	48.56	30	22.4	9	26.22	36	60.2	5
Sept. 6.7	34.19	70	52.6	4	23.37	32	54.6	6	48.86	30	23.1	7	26.58	36	60.8	6
16.7	34.89	70	53.3	7	23.69	32	55.2	6	49.16	30	23.6	5	26.94	36	61.4	6
26.7	35.57	68	54.4	11	24.00	31	55.7	5	49.45	29	23.8	2	27.29	35	62.1	7
Oct. 6.7	36.22	65	55.8	14	24.30	30	56.1	4	49.73	28	23.7	1	27.63	34	62.7	6
16.6	36.84	62	57.5	17	24.58	28	56.3	2	49.99	26	23.3	4	27.95	32	63.4	7
26.6	37.40	56	59.4	19	24.85	27	56.4	1	50.24	25	22.7	6	28.25	30	64.1	7
Nov. 5.6	37.91	51	61.6	22	25.09	24	56.5	1	50.46	22	21.9	8	28.53	28	64.8	7
15.5	38.36	45	64.0	24	25.30	21	56.4	1	50.66	20	20.9	10	28.78	25	65.6	8
25.5	38.72	36	66.5	25	25.49	19	56.3	1	50.84	18	19.8	11	29.00	22	66.3	7
Dec. 5.5	39.00	28	69.1	26	25.64	15	56.2	1	50.98	14	18.7	11	29.17	17	67.1	8
15.5	39.18	18	71.7	26	25.76	12	56.1	1	51.08	10	17.5	12	29.30	13	67.8	7
25.4	39.26	8	74.2	25	25.83	7	55.9	2	51.14	6	16.4	11	29.39	9	68.5	7
35.4	39.23	3	76.6	24	25.86	3	55.8	1	51.16	2	15.4	10	29.42	3	69.2	7
Sec δ, Tan δ	2.478		+2.267		1.056		+0.338		1.001		+0.040		1.193		+0.650	
Mean Place	$29^{s}.592$		$53''.08$		$20^{s}.487$		$39''.74$		$46^{s}.256$		$2''.67$		$23^{s}.444$		$51''.25$	
$D'_{\psi}a$, $D_{\omega}a$	+0.06		−0.05		+0.01		−0.01		0.00		0.00		+0.02		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+0.9		+0.1		+0.9		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**β Camelop.** Mag. 4.2				**ε Aurigæ.** Var. 3.0–4.5				**ζ Aurigæ.** Mag. 3.9				**ι Tauri.** Mag. 4.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 4 55		° ′ +60 19		h m 4 55		° ′ +43 41		h m 4 56		° ′ +40 57		h m 4 57		° ′ +21 28	
	s		″		s		″		s		″		s		″	
Jan. 0.4	48.32		19.9		49.60		63.0		29.65		18.2		58.80		14.8	
10.4	48.28	4	21.9	20	49.60	0	64.3	13	29.65	0	19.3	11	58.81	1	14.9	1
20.4	48.16	12	23.7	18	49.54	6	65.4	11	29.60	5	20.2	9	58.77	4	14.9	0
30.3	47.96	20	25.3	16	49.43	11	66.3	9	29.50	10	21.0	8	58.70	7	14.9	0
Feb. 9.3	47.70	26	26.5	12	49.27	16	66.9	6	29.35	15	21.6	6	58.58	12	14.9	0
19.3	47.39	31	27.2	7	49.08	19	67.3	4	29.16	19	21.9	3	58.44	14	14.8	1
Mar. 1.3	47.05	34	27.5	3	48.86	22	67.4	1	28.95	21	22.0	1	58.28	16	14.6	2
11.2	46.69	36	27.4	1	48.63	23	67.2	2	28.74	21	21.8	2	58.11	17	14.4	2
21.2	46.34	35	26.8	6	48.40	23	66.8	4	28.52	22	21.4	4	57.94	17	14.2	2
31.2	46.01	33	25.9	9	48.19	21	66.1	7	28.33	19	20.7	7	57.78	16	13.9	3
Apr. 10.2	45.73	28	24.5	14	48.01	18	65.2	9	28.16	17	19.9	8	57.64	14	13.7	2
20.1	45.51	22	22.9	16	47.88	13	64.1	11	28.03	13	18.9	10	57.54	10	13.4	3
30.1	45.36	15	21.1	18	47.79	9	62.8	13	27.95	8	17.8	11	57.48	6	13.2	2
May 10.1	45.29	7	19.1	20	47.76	3	61.6	12	27.92	3	16.7	11	57.46	2	13.0	2
20.0	45.31	2	17.0	21	47.79	3	60.3	13	27.95	3	15.5	12	57.49	3	12.9	1
30.0	45.40	9	14.9	21	47.88	9	59.0	13	28.04	9	14.4	11	57.56	7	12.9	0
June 9.0	45.59	19	12.9	20	48.03	15	57.9	11	28.18	14	13.4	10	57.68	12	13.0	1
19.0	45.85	26	11.0	19	48.24	21	56.9	10	28.38	20	12.5	9	57.85	17	13.3	3
28.9	46.19	34	9.3	17	48.49	25	56.0	9	28.62	24	11.8	7	58.05	20	13.7	4
July 8.9	46.59	40	7.8	15	48.79	30	55.3	7	28.91	29	11.3	5	58.29	24	14.1	4
18.9	47.04	45	6.6	12	49.13	34	54.8	5	29.24	33	10.9	4	58.56	27	14.7	6
28.9	47.54	50	5.7	9	49.49	36	54.5	3	29.59	35	10.7	2	58.85	29	15.3	6
Aug. 7.8	48.08	54	5.1	6	49.88	39	54.4	1	29.96	37	10.7	0	59.16	31	15.9	6
17.8	48.64	56	4.7	4	50.28	40	54.5	1	30.35	39	10.9	2	59.48	32	16.6	7
27.8	49.21	57	4.7	0	50.69	41	54.8	3	30.74	39	11.2	3	59.81	33	17.2	6
Sept. 6.7	49.80	59	5.0	3	51.11	42	55.2	4	31.14	40	11.6	4	60.14	33	17.8	6
16.7	50.38	58	5.6	6	51.52	41	55.8	6	31.54	40	12.2	6	60.46	32	18.3	5
26.7	50.94	56	6.5	9	51.92	40	56.5	7	31.93	39	12.9	7	60.78	32	18.7	4
Oct. 6.7	51.49	55	7.6	11	52.31	39	57.4	9	32.30	37	13.7	8	61.09	31	19.1	4
16.6	52.02	53	9.0	14	52.68	37	58.3	9	32.66	36	14.6	9	61.39	30	19.3	2
26.6	52.51	49	10.7	17	53.03	35	59.4	11	33.00	34	15.5	9	61.66	27	19.5	2
Nov. 5.6	52.95	44	12.6	19	53.36	33	60.6	12	33.31	31	16.6	11	61.92	26	19.6	1
15.6	53.34	39	14.6	20	53.65	29	61.9	13	33.59	28	17.7	11	62.15	23	19.6	0
25.5	53.67	33	16.8	22	53.89	24	63.2	13	33.83	24	18.9	12	62.35	20	19.7	1
Dec. 5.5	53.93	26	19.0	22	54.10	21	64.5	13	34.03	20	20.1	12	62.52	17	19.7	0
15.5	54.12	19	21.3	23	54.25	15	65.9	14	34.17	14	21.3	12	62.65	13	19.7	0
25.4	54.22	10	23.6	23	54.34	9	67.3	14	34.27	10	22.5	12	62.73	8	19.7	0
35.4	54.24	2	25.7	21	54.38	4	68.6	13	34.31	4	23.6	11	62.77	4	19.7	0
Sec δ, Tan δ	2.020		+1.755		1.383		+0.956		1.324		+0.868		1.075		+0.393	
Mean Place	45ˢ.698		4″.52		47ˢ.716		49″.55		27ˢ.833		5″.07		57ˢ.252		4″.52	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.05		−0.03		+0.02		−0.02		+0.02		−0.02		+0.01		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**11 Orionis.** Mag. 4.6				**η Aurigæ.** Mag. 3.3				**ε Leporis.** Mag. 3.3				**β Eridani.** Mag. 2.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declin tion	
	h m		° ′		h m		° ′		h m		° ′		h m		°	
	4 59		+15 17		5 0		+41 7		5 1		−22 28		5 3		− 5	
	s		″		s		″		s		″		s		″	
Jan. 0.4	40.73		16.2		30.76		22.0		50.80		65.0		38.79		42.0	
10.4	40.74	1	15.9	3	30.77	1	23.1	11	50.77	3	67.1	21	38.79	0	43.4	
20.4	40.71	3	15.6	3	30.72	5	24.1	10	50.71	6	69.0	19	38.75	4	44.6	
30.4	40.64	7	15.3	3	30.62	10	24.9	8	50.60	11	70.6	16	38.67	8	45.7	
Feb. 9.3	40.53	11	15.1	2	30.47	15	25.5	6	50.45	15	71.8	12	38.56	11	46.5	
19.3	40.39	14	14.9	2	30.29	18	25.9	4	50.28	17	72.7	9	38.42	14	47.1	
Mar. 1.3	40.23	16	14.7	2	30.08	21	26.0	1	50.09	19	73.2	5	38.26	16	47.5	
11.2	40.06	17	14.5	2	29.86	22	25.9	1	49.90	19	73.3	1	38.09	17	47.7	
21.2	39.90	16	14.3	2	29.64	22	25.5	4	49.70	20	73.0	3	37.92	17	47.6	
31.2	39.75	15	14.2	1	29.44	20	24.9	6	49.52	18	72.4	6	37.76	16	47.3	
Apr. 10.2	39.61	14	14.1	1	29.27	17	24.0	9	49.35	17	71.4	10	37.62	14	46.8	
20.1	39.51	10	14.1	0	29.14	13	23.1	9	49.22	13	70.1	13	37.51	11	46.1	
30.1	39.45	6	14.1	0	29.05	9	22.0	11	49.12	10	68.5	16	37.44	7	45.1	
May 10.1	39.43	2	14.3	2	29.02	3	20.8	12	49.06	6	66.6	19	37.40	4	44.0	
20.1	39.45	2	14.5	2	29.05	3	19.7	11	49.05	1	64.5	21	37.41	1	42.7	
30.0	39.52	7	14.9	4	29.13	8	18.6	11	49.08	3	62.2	23	37.46	5	41.2	
June 9.0	39.63	11	15.4	5	29.27	14	17.5	11	49.16	8	59.7	25	37.55	9	39.5	
19.0	39.79	16	16.0	6	29.47	20	16.6	9	49.28	12	57.2	25	37.68	13	37.8	
28.9	39.99	20	16.7	7	29.71	24	15.9	7	49.44	16	54.6	26	37.85	17	36.0	
July 8.9	40.22	23	17.5	8	29.99	28	15.3	6	49.64	20	52.1	25	38.06	21	34.2	
18.9	40.47	25	18.3	8	30.31	32	14.9	4	49.87	23	49.7	24	38.29	23	32.5	
28.9	40.75	28	19.2	9	30.66	35	14.6	3	50.13	26	47.5	22	38.55	26	30.9	
Aug. 7.8	41.05	30	20.0	8	31.03	37	14.5	1	50.41	28	45.6	19	38.82	27	29.4	
17.8	41.35	30	20.8	8	31.42	39	14.6	1	50.70	29	44.0	16	39.11	29	28.1	
27.8	41.67	32	21.5	7	31.82	40	14.9	3	51.00	30	42.8	12	39.40	29	27.1	
Sept. 6.7	41.99	32	22.1	6	32.21	39	15.3	4	51.31	31	42.0	8	39.70	30	26.4	
16.7	42.30	31	22.6	5	32.61	40	15.8	5	51.61	30	41.7	3	40.00	30	26.0	
26.7	42.61	31	23.0	4	33.00	39	16.5	7	51.91	30	41.9	2	40.29	29	26.0	
Oct. 6.7	42.91	30	23.2	2	33.38	38	17.2	7	52.20	29	42.6	7	40.57	28	26.3	
16.6	43.19	28	23.2	0	33.74	36	18.1	9	52.47	27	43.7	11	40.84	27	26.9	
26.6	43.46	27	23.1	1	34.08	34	19.0	9	52.72	25	45.3	16	41.09	25	27.8	
Nov. 5.6	43.71	25	22.9	2	34.40	32	20.0	10	52.95	23	47.2	19	41.32	23	29.0	12
15.6	43.93	22	22.6	3	34.68	28	21.1	11	53.15	20	49.4	22	41.53	21	30.4	14
25.5	44.13	20	22.2	4	34.93	25	22.3	12	53.32	17	51.7	23	41.71	18	31.9	15
Dec. 5.5	44.29	16	21.9	3	35.13	20	23.5	12	53.45	13	54.2	25	41.85	14	33.5	16
15.5	44.41	12	21.5	4	35.29	16	24.7	12	53.54	9	56.7	25	41.96	11	35.2	17
25.4	44.49	8	21.1	4	35.39	10	25.9	12	53.59	5	59.1	24	42.03	7	36.8	16
35.4	44.53	4	20.7	4	35.43	4	27.0	11	53.59	0	61.4	23	42.06	3	38.3	15
Sec δ, Tan δ	1.037		+0.273		1.328		+0.873		1.082		−0.414		1.004		−0.091	
Mean Place	39ˢ.223		6″.78		28ˢ.913		9″.12		49ˢ.196		69″.13		37ˢ.300		48″.43	
D′ψ a, Dω a	+0.01		0.00		+0.02		−0.02		−0.01		+0.01		0.00		0.00	
Dψ δ, Dω δ	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Aurigæ. Mag. 4.8				19 H. Camelop. Mag. 5.2				μ Leporis. Mag. 3.3				α Aurigæ. Mag. 0.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 5 7		° ′ +38 23		h m 5 8		° ′ +79 8		h m 5 9		° ′ −16 17		h m 5 10		° ′ +45 54	
	s		″		s		″		s		″		s		″	
Jan. 0.4	34.26		13.3		28.47		21.2		5.64		78.6		22.05		55.0	
10.4	34.27	1	14.3	10	28.27	20	24.0	28	5.63	1	80.5	19	22.07	2	56.4	14
20.4	34.24	3	15.2	9	27.85	42	26.6	26	5.58	5	82.2	17	22.02	5	57.6	12
30.4	34.15	9	15.9	7	27.23	62	28.9	23	5.49	9	83.6	14	21.91	11	58.7	11
Feb. 9.3	34.01	14	16.5	6	26.45	78	30.7	18	5.36	13	84.7	11	21.76	15	59.5	8
19.3	33.84	17	16.9	4	25.54	91	31.9	12	5.21	15	85.5	8	21.56	20	60.0	5
Mar. 1.3	33.65	19	17.0	1	24.55	99	32.6	7	5.03	18	86.0	5	21.34	22	60.3	3
11.2	33.44	21	16.9	1	23.51	104	32.8	2	4.84	19	86.2	2	21.10	24	60.2	1
21.2	33.23	21	16.6	3	22.48	103	32.3	5	4.66	18	86.1	1	20.86	24	59.9	3
31.2	33.04	19	16.0	6	21.51	97	31.4	9	4.49	17	85.6	5	20.64	22	59.3	6
Apr. 10.2	32.87	17	15.3	7	20.65	86	29.9	15	4.33	16	84.8	8	20.44	20	58.4	9
20.1	32.73	14	14.5	8	19.93	72	28.0	19	4.20	13	83.8	10	20.29	15	57.3	11
30.1	32.65	8	13.5	10	19.37	56	25.7	23	4.11	9	82.4	14	20.18	11	56.0	13
May 10.1	32.61	4	12.5	10	19.01	36	23.1	26	4.06	5	80.8	16	20.13	5	54.7	13
20.1	32.63	2	11.5	10	18.85	16	20.4	27	4.05	1	79.0	18	20.14	1	53.3	14
30.0	32.70	7	10.6	9	18.91	6	17.6	28	4.08	3	77.0	20	20.21	7	51.9	14
June 9.0	32.83	13	9.7	9	19.18	27	14.8	28	4.16	8	74.8	22	20.35	14	50.6	13
19.0	33.01	18	8.9	8	19.65	47	12.1	27	4.28	12	72.5	23	20.54	19	49.3	13
28.9	33.24	23	8.2	7	20.32	67	9.6	25	4.44	16	70.2	23	20.79	25	48.2	11
July 8.9	33.51	27	7.7	5	21.16	84	7.3	23	4.63	19	68.0	22	21.08	29	47.3	9
18.9	33.81	30	7.4	3	22.16	100	5.3	20	4.86	23	65.8	22	21.41	33	46.6	7
28.9	34.14	33	7.2	2	23.29	113	3.6	17	5.11	25	63.8	20	21.77	36	46.0	6
Aug. 7.8	34.50	36	7.1	1	24.54	125	2.3	13	5.38	27	62.0	18	22.16	39	45.7	3
17.8	34.87	37	7.2	1	25.87	133	1.3	10	5.66	28	60.5	15	22.57	41	45.5	2
27.8	35.25	38	7.5	3	27.26	139	0.8	5	5.96	30	59.4	11	23.00	43	45.6	1
Sept. 6.8	35.63	38	7.8	3	28.68	142	0.7	1	6.26	30	58.6	8	23.42	42	45.8	2
16.7	36.01	38	8.3	5	30.11	143	1.1	4	6.56	30	58.2	4	23.85	43	46.2	4
26.7	36.39	38	8.8	5	31.53	142	1.9	8	6.85	29	58.3	1	24.28	43	46.8	6
Oct. 6.7	36.76	37	9.4	6	32.91	138	3.0	11	7.14	29	58.9	6	24.69	41	47.5	7
16.6	37.12	36	10.1	7	34.22	131	4.6	16	7.41	27	59.8	9	25.09	40	48.3	8
26.6	37.45	33	10.9	8	35.44	122	6.6	20	7.67	26	61.1	13	25.46	37	49.3	10
Nov. 5.6	37.76	31	11.7	8	36.54	110	8.9	23	7.90	23	62.8	17	25.81	35	50.5	12
15.6	38.05	29	12.6	9	37.50	96	11.4	25	8.11	21	64.7	19	26.13	32	51.7	12
25.5	38.29	24	13.6	10	38.29	79	14.2	28	8.29	18	66.8	21	26.40	27	53.1	14
Dec. 5.5	38.50	21	14.6	10	38.89	60	17.2	30	8.43	14	69.1	23	26.63	23	54.5	14
15.5	38.66	16	15.6	10	39.28	39	20.3	31	8.53	10	71.3	22	26.80	17	55.9	14
25.5	38.76	10	16.6	10	39.44	16	23.3	30	8.59	6	73.4	21	26.92	12	57.4	15
35.4	38.81	5	17.6	10	39.38	6	26.3	30	8.61	2	75.5	21	26.97	5	58.8	14
Sec δ, Tan δ	1.276		+0.792		5.306		+5.211		1.042		−0.293		1.437		+1.032	
Mean Place	32ˢ.436		1″.12		21ˢ.680		5″.39		4ˢ.079		83″.62		20ˢ.020		42″.05	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.02		−0.01		+0.13		−0.08		−0.01		0.00		+0.03		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Orionis. Mag. 0.3				λ Aurigæ. Mag. 4.8				τ Orionis. Mag. 3.7				ο Columbæ. Mag. 4.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 5 10		° ′ − 8 17		h m 5 13		° ′ +40 1		h m 5 13		° ′ − 6 55		h m 5 14		° ′ −34 58	
	s		″		s		″		s		″		s		″	
Jan. 0.4	25.76		54.7		7.25		37.5		27.33		65.3		24.61		40.9	
10.4	25.76	0	56.2	15	7.28	3	38.6	11	27.34	1	66.8	15	24.57	4	43.5	20
20.4	25.72	4	57.6	14	7.25	3	39.6	10	27.30	4	68.1	13	24.48	9	45.8	23
30.4	25.64	8	58.8	12	7.16	9	40.4	8	27.23	7	69.3	12	24.35	13	47.8	20
Feb. 9.3	25.53	11	59.7	9	7.02	14	41.0	6	27.12	11	70.2	9	24.17	18	49.3	15
19.3	25.39	14	60.4	7	6.85	17	41.4	4	26.98	14	70.9	7	23.96	21	50.4	11
Mar. 1.3	25.23	16	60.9	5	6.65	20	41.6	2	26.82	16	71.3	4	23.74	22	51.1	7
11.2	25.05	18	61.1	2	6.44	21	41.5	1	26.64	18	71.5	2	23.50	24	51.3	2
21.2	24.88	17	61.0	1	6.23	21	41.2	3	26.47	17	71.5	0	23.26	24	51.0	3
31.2	24.72	16	60.7	3	6.03	20	40.7	5	26.31	16	71.2	3	23.03	23	50.3	7
Apr. 10.2	24.58	14	60.1	6	5.85	18	40.0	7	26.17	14	70.7	5	22.82	21	49.2	11
20.1	24.46	12	59.3	8	5.71	14	39.1	9	26.05	12	69.9	8	22.65	17	47.7	15
30.1	24.37	9	58.2	11	5.62	9	38.1	10	25.97	8	68.9	10	22.51	14	45.8	19
May 10.1	24.33	4	57.0	12	5.58	4	37.0	11	25.92	5	67.7	12	22.41	10	43.6	22
20.1	24.32	1	55.5	15	5.59	1	35.9	11	25.91	1	66.3	14	22.36	5	41.1	25
30.0	24.36	4	53.9	16	5.66	7	34.8	11	25.95	4	64.8	15	22.35	1	38.4	27
June 9.0	24.45	9	52.1	18	5.78	12	33.8	10	26.04	9	63.1	17	22.40	5	35.6	28
19.0	24.58	13	50.2	19	5.96	18	32.9	9	26.16	12	61.3	18	22.50	10	32.6	30
28.9	24.74	16	48.3	19	6.19	23	32.1	8	26.32	16	59.5	18	22.64	14	29.6	30
July 8.9	24.94	20	46.4	19	6.46	27	31.5	6	26.52	20	57.6	19	22.83	19	26.7	29
18.9	25.16	22	44.6	18	6.76	30	31.0	5	26.74	22	55.8	18	23.05	22	24.0	27
28.9	25.41	25	42.8	18	7.10	34	30.6	4	26.99	25	54.1	17	23.31	26	21.5	25
Aug. 7.8	25.68	27	41.3	15	7.46	36	30.5	1	27.26	27	52.6	15	23.59	28	19.3	22
17.8	25.96	28	39.9	14	7.84	38	30.4	1	27.54	28	51.3	13	23.89	30	17.5	18
27.8	26.26	30	38.9	10	8.22	38	30.6	2	27.83	29	50.3	10	24.21	32	16.1	14
Sept. 6.8	26.55	29	38.2	7	8.62	40	30.8	2	28.13	30	49.6	7	24.54	33	15.3	8
16.7	26.85	30	37.8	4	9.01	39	31.2	4	28.43	30	49.2	4	24.87	33	15.0	3
26.7	27.14	29	37.8	0	9.40	39	31.7	5	28.72	29	49.2	0	25.19	32	15.3	3
Oct. 6.7	27.42	28	38.1	3	9.78	38	32.2	5	29.00	28	49.5	3	25.51	32	16.1	8
16.6	27.70	28	38.8	7	10.15	37	32.9	7	29.28	28	50.2	7	25.81	30	17.5	14
26.6	27.96	26	39.9	11	10.50	35	33.7	8	29.54	26	51.2	10	26.08	27	19.4	19
Nov. 5.6	28.19	23	41.2	13	10.82	32	34.5	8	29.78	24	52.5	13	26.33	25	21.7	23
15.6	28.40	21	42.8	16	11.12	30	35.4	9	29.99	21	54.0	15	26.55	22	24.3	26
25.5	28.59	19	44.5	17	11.37	25	36.4	10	30.18	19	55.6	16	26.73	18	27.1	28
Dec. 5.5	28.74	15	46.3	18	11.59	22	37.5	11	30.33	15	57.3	17	26.86	13	30.1	30
15.5	28.85	11	48.1	18	11.76	17	38.6	11	30.45	12	59.1	18	26.95	9	33.2	31
25.5	28.92	7	49.9	18	11.87	11	39.6	10	30.52	7	60.8	17	26.99	4	36.2	30
35.4	28.95	3	51.6	17	11.93	6	40.7	11	30.55	3	62.5	17	26.98	1	38.9	27
Sec δ, Tan δ	1.011		−0.146		1.306		+0.840		1.007		−0.122		1.220		−0.700	
Mean Place	$24^s.244$		$60''.74$		$5^s.368$		$25''.40$		$25^s.814$		$71''.57$		$22^s.816$		$44''.17$	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		0.00		+0.02		−0.01		0.00		0.00		−0.02		+0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Orionis. Mag. 1.7				β Tauri. Mag. 1.8				17 Camelop. Mag. 5.8				β Leporis. Mag. 3.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 20		+ 6 16		5 20		+28 32		5 22		+62 59		5 24		−20 49	
	s		″		s		″		s		″		s		″	
Jan. 0.4	32.59		29.2		52.97		19.3		5.76		62.0		35.24		33.2	
10.4	32.62	3	28.4	8	53.00	3	19.7	4	5.76	0	64.3	23	35.24	0	35.4	22
20.4	32.60	2	27.6	8	52.98	2	20.1	4	5.67	9	66.4	21	35.19	5	37.3	19
30.4	32.54	6	27.0	6	52.91	7	20.5	4	5.49	18	68.2	18	35.11	8	39.0	17
Feb. 9.3	32.44	10	26.5	5	52.81	10	20.7	2	5.23	26	69.7	15	34.98	13	40.3	13
19.3	32.31	13	26.1	4	52.67	14	20.9	2	4.91	32	70.8	11	34.82	16	41.3	10
Mar. 1.3	32.16	15	25.8	3	52.50	17	21.0	1	4.54	37	71.4	6	34.64	18	42.0	7
11.3	31.99	17	25.6	2	52.32	18	20.9	1	4.15	39	71.6	2	34.45	19	42.3	3
21.2	31.83	16	25.5	1	52.13	19	20.7	2	3.75	40	71.3	3	34.25	20	42.2	1
31.2	31.67	16	25.6	1	51.96	17	20.4	3	3.37	38	70.6	7	34.06	19	41.8	4
Apr. 10.2	31.53	14	25.7	1	51.80	16	20.0	4	3.04	33	69.5	11	33.89	17	41.0	8
20.1	31.42	11	26.0	3	51.68	12	19.6	4	2.76	28	68.1	14	33.75	14	39.9	11
30.1	31.34	8	26.5	5	51.59	9	19.1	5	2.55	21	66.3	18	33.64	11	38.5	14
May 10.1	31.30	4	27.0	5	51.55	4	18.6	5	2.42	13	64.3	20	33.56	8	36.8	17
20.1	31.30	0	27.7	7	51.56	1	18.1	5	2.38	4	62.2	21	33.53	3	34.9	19
30.0	31.34	4	28.6	9	51.62	6	17.7	4	2.43	5	60.0	22	33.54	1	32.7	22
June 9.0	31.43	9	29.5	9	51.72	10	17.3	4	2.57	14	57.8	22	33.60	6	30.4	23
19.0	31.56	13	30.6	11	51.87	15	17.1	2	2.79	22	55.7	21	33.70	10	28.0	24
29.0	31.73	17	31.7	11	52.07	20	16.9	2	3.10	31	53.7	20	33.84	14	25.5	25
July 8.9	31.93	20	32.9	12	52.30	23	16.9	0	3.49	39	51.9	18	34.02	18	23.1	24
18.9	32.16	23	34.0	11	52.56	26	16.9	0	3.94	45	50.3	16	34.23	21	20.8	23
28.9	32.41	25	35.2	12	52.85	29	17.0	1	4.45	51	49.0	13	34.47	24	18.6	22
Aug. 7.8	32.68	27	36.3	11	53.16	31	17.2	2	5.00	55	47.9	11	34.73	26	16.7	19
17.8	32.97	29	37.2	9	53.49	33	17.5	3	5.58	58	47.2	7	35.01	28	15.1	16
27.8	33.27	30	38.0	8	53.83	34	17.8	3	6.19	61	46.7	5	35.31	30	13.9	12
Sept. 6.8	33.57	30	38.6	6	54.18	35	18.1	3	6.81	62	46.6	1	35.61	30	13.0	9
16.7	33.87	30	38.9	3	54.52	34	18.5	4	7.44	63	46.8	2	35.91	30	12.6	4
26.7	34.17	30	39.1	2	54.87	35	18.8	3	8.07	63	47.3	5	36.21	30	12.7	1
Oct. 6.7	34.46	29	39.0	1	55.20	33	19.1	3	8.69	62	48.1	8	36.51	30	13.3	6
16.7	34.75	29	38.6	4	55.53	33	19.4	3	9.28	59	49.2	11	36.79	28	14.3	10
26.6	35.02	27	38.1	5	55.84	31	19.7	3	9.84	56	50.6	14	37.06	27	15.8	15
Nov. 5.6	35.27	25	37.4	7	56.13	29	19.9	2	10.37	53	52.3	17	37.31	25	17.6	18
15.6	35.50	23	36.5	9	56.40	27	20.2	3	10.84	47	54.2	19	37.53	22	19.7	21
25.5	35.71	21	35.5	10	56.64	24	20.5	3	11.24	40	56.3	21	37.72	19	22.0	23
Dec. 5.5	35.88	17	34.5	10	56.84	20	20.9	4	11.57	33	58.5	22	37.87	15	24.5	25
15.5	36.01	13	33.5	10	57.00	16	21.2	3	11.82	25	60.8	23	37.99	12	27.0	25
25.5	36.11	10	32.5	10	57.11	11	21.6	4	11.98	16	63.2	24	38.06	7	29.4	24
35.4	36.16	5	31.6	9	57.18	7	22.0	4	12.04	6	65.5	23	38.08	2	31.8	24
Sec δ, Tan δ	1.006		+0.110		1.138		+0.544		2.203		+1.963		1.070		−0.380	
Mean Place	$31^{s}.060$		$21''.33$		$51^{s}.261$		$8''.85$		$2^{s}.664$		$48''.35$		$33^{s}.629$		$38''.16$	
$D'_{\psi}a$, $D_{\omega}a$	0.00		0.00		+0.01		−0.01		+0.05		−0.02		−0.01		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**χ Aurigæ.** Mag. 4.9				**δ Orionis.** Mag. 2.5				**Groombridge 966.** Mag. 6.4				**α Leporis.** Mag. 2.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 27		+32 7		5 27		− 0 21		5 28		+74 59		5 28		−17 52	
	s		″		s		″		s		″		s		″	
Jan. 0.5	9.54		56.4		38.28		36.0		18.38		34.1		57.81		54.0	
10.4	9.58	4	57.0	6	38.31	3	37.2	12	18.33	5	36.9	28	57.82	1	56.1	21
20.4	9.57	1	57.6	6	38.29	2	38.3	11	18.12	21	39.4	25	57.78	4	57.9	18
30.4	9.50	7	58.1	5	38.23	6	39.3	10	17.76	36	41.7	23	57.70	8	59.5	16
Feb. 9.3	9.39	11	58.6	5	38.13	10	40.0	7	17.26	50	43.6	19	57.58	12	60.8	13
19.3	9.25	14	58.9	3	38.00	13	40.6	6	16.65	61	45.0	14	57.43	15	61.8	10
Mar. 1.3	9.08	17	59.1	2	37.85	15	41.0	4	15.97	68	45.9	9	57.26	17	62.5	7
11.3	8.89	19	59.1	0	37.68	17	41.2	2	15.24	73	46.3	4	57.07	19	62.8	3
21.2	8.70	19	58.9	2	37.51	17	41.3	1	14.50	74	46.1	2	56.88	19	62.7	1
31.2	8.51	19	58.6	3	37.35	16	41.1	2	13.79	71	45.3	8	56.70	18	62.4	3
Apr. 10.2	8.35	16	58.1	5	37.21	14	40.8	3	13.15	64	44.1	12	56.53	17	61.7	7
. 20.2	8.21	14	57.6	5	37.09	12	40.3	5	12.60	55	42.5	16	56.39	14	60.7	10
30.1	8.12	9	57.0	6	37.00	9	39.6	7	12.16	44	40.4	21	56.28	11	59.4	13
May 10.1	8.07	5	56.3	7	36.95	5	38.8	8	11.86	30	38.1	23	56.21	7	57.8	16
20.1	8.07	0	55.6	7	36.94	1	37.8	10	11.71	15	35.6	25	56.18	3	56.0	18
30.0	8.12	5	55.0	6	36.98	4	36.6	12	11.71	0	33.0	26	56.19	1	54.0	20
June 9.0	8.22	10	54.5	5	37.05	7	35.3	13	11.86	15	30.3	27	56.25	6	51.8	22
19.0	8.37	15	54.0	5	37.17	12	33.9	14	12.16	30	27.6	27	56.35	10	49.6	22
29.0	8.57	20	53.6	4	37.32	15	32.4	15	12.61	45	25.1	25	56.49	14	47.3	23
July 8.9	8.80	23	53.3	3	37.51	19	30.9	15	13.19	58	22.8	23	56.66	17	45.0	23
18.9	9.07	27	53.1	2	37.73	22	29.5	14	13.90	71	20.7	21	56.87	21	42.8	22
28.9	9.36	29	53.0	1	37.97	24	28.1	14	14.70	80	18.9	18	57.11	24	40.7	21
Aug. 7.8	9.68	32	53.1	1	38.23	26	26.8	13	15.59	89	17.4	15	57.37	26	38.8	19
17.8	10.02	34	53.2	1	38.51	28	25.7	11	16.55	96	16.2	12	57.64	27	37.2	16
27.8	10.37	35	53.4	2	38.80	29	24.8	9	17.57	102	15.5	7	57.93	29	36.0	12
Sept. 6.8	10.72	35	53.6	2	39.10	30	24.2	6	18.62	105	15.1	4	58.23	30	35.2	8
16.7	11.08	36	53.8	2	39.40	30	23.8	4	19.68	106	15.1	0	58.53	30	34.8	4
26.7	11.44	36	54.1	3	39.69	29	23.7	1	20.74	·106	15.6	5	58.83	30	34.9	1
Oct. 6.7	11.79	35	54.4	3	39.98	29	24.0	3	21.79	105	16.4	8	59.12	29	35.4	5
16.7	12.13	34	54.7	3	40.27	29	24.5	5	22.80	101	17.6	12	59.40	28	36.3	9
26.6	12.46	33	55.1	4	40.54	27	25.3	8	23.75	95	19.2	16	59.67	27	37.7	14
Nov. 5.6	12.76	30	55.5	4	40.79	25	26.3	10	24.62	87	21.1	19	59.92	25	39.4	17
15.6	13.04	28	55.9	4	41.02	23	27.5	12	25.40	78	23.4	23	60.15	23	41.4	20
25.5	13.30	26	56.4	5	41.22	20	28.9	14	26.07	67	25.9	25	60.34	19	43.6	22
Dec. 5.5	13.51	21	56.9	5	41.39	17	30.3	14	26.60	53	28.6	27	60.50	16	45.9	23
15.5	13.68	17	57.5	6	41.53	14	31.7	14	26.99	39	31.4	28	60.62	12	48.3	24
25.5	13.81	13	58.1	6	41.63	10	33.1	14	27.21	22	34.3	29	60.70	8	50.6	23
35.4	13.88	7	58.7	6	41.68	5	34.5	14	27.27	6	37.1	28	60.74	4	52.9	23
Sec δ, Tan δ	1.181		+0.628		1.000		−0.006		3.862		+3.730		1.051		−0.323	
Mean Place	7ˢ.759		45″.79		36ˢ.744		43″.13		13ˢ.037		20″.12		56ˢ.219		59″.36	
D′ψ α, Dω α	+0.02		−0.01		0.00		0.00		+0.10		−0.03		−0.01		0.00	
Dψ δ, Dω δ	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

an Solar Date.	φ¹ Orionis. Mag. 4.5				ι Orionis. Mag. 2.9				ε Orionis. Mag. 1.8				ζ Tauri. Mag. 3.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 30		+ 9 25		5 31		− 5 57		5 31		− 1 15		5 32		+21 5	
	s		″		s		″		s		″		s		″	
n. 0.5	7.46		63.7		15.10		49.6		52.49		14.5		31.91		36.6	
10.4	7.50	4	63.0	7	15.12	2	51.1	15	52.52	3	15.8	13	31.96	5	36.6	0
20.4	7.49	1	62.4	6	15.10	2	52.5	14	52.50	2	17.0	12	31.96	0	36.6	0
30.4	7.44	5	61.9	5	15.04	6	53.7	12	52.44	6	18.0	10	31.90	6	36.6	0
b. 9.3	7.35	9	61.5	4	14.94	10	54.6	9	52.35	9	18.8	8	31.81	9	36.6	0
19.3	7.22	13	61.1	4	14.81	13	55.4	8	52.22	13	19.4	6	31.68	13	36.6	0
r. 1.3	7.07	15	60.9	2	14.65	16	55.9	5	52.07	15	19.8	4	31.53	15	36.6	0
11.3	6.91	16	60.8	1	14.48	17	56.1	2	51.90	17	20.0	2	31.36	17	36.5	1
21.2	6.74	17	60.7	1	14.31	17	56.1	0	51.73	17	20.1	1	31.18	18	36.4	1
31.2	6.58	16	60.7	0	14.14	17	55.9	2	51.57	16	19.9	2	31.01	17	36.3	1
r. 10.2	6.44	14	60.8	1	13.99	15	55.5	4	51.42	15	19.6	3	30.86	15	36.1	2
20.2	6.32	12	61.0	2	13.87	12	54.8	7	51.30	12	19.1	5	30.74	12	35.9	2
30.1	6.23	9	61.3	3	13.78	9	54.0	8	51.21	9	18.4	7	30.65	9	35.8	1
y 10.1	6.18	5	61.7	4	13.72	6	52.9	11	51.15	6	17.5	9	30.61	4	35.6	2
20.1	6.18	0	62.2	5	13.70	2	51.6	13	51.14	1	16.5	10	30.60	1	35.5	1
30.0	6.22	4	62.8	6	13.72	2	50.2	14	51.17	3	15.3	12	30.64	4	35.5	0
ne 9.0	6.30	8	63.5	7	13.79	7	48.6	16	51.24	7	13.9	14	30.73	9	35.6	1
19.0	6.42	12	64.4	9	13.90	11	46.9	17	51.35	11	12.5	14	30.86	13	35.7	1
29.0	6.58	16	65.3	9	14.05	15	45.2	17	51.50	15	11.0	15	31.04	18	36.0	3
ly 8.9	6.78	20	66.3	10	14.23	18	43.4	18	51.69	19	9.5	15	31.25	21	36.3	3
18.9	7.01	23	67.2	9	14.44	21	41.7	17	51.90	21	8.0	15	31.49	24	36.6	3
28.9	7.26	25	68.2	10	14.68	24	40.1	16	52.14	24	6.6	14	31.75	26	37.0	4
g. 7.9	7.53	27	69.1	9	14.93	25	38.6	15	52.40	26	5.2	14	32.04	29	37.5	5
17.8	7.82	29	69.9	8	15.21	28	37.4	12	52.68	28	4.1	11	32.34	30	37.9	4
27.8	8.11	29	70.6	7	15.49	28	36.4	10	52.97	29	3.2	9	32.66	32	38.3	4
pt. 6.8	8.41	30	71.1	5	15.79	30	35.7	7	53.26	29	2.6	6	32.98	32	38.6	3
16.7	8.72	31	71.4	3	16.08	29	35.3	4	53.56	30	2.2	4	33.31	33	38.9	3
26.7	9.03	31	71.6	2	16.38	30	35.3	0	53.85	29	2.1	1	33.63	32	39.1	2
ct. 6.7	9.33	30	71.5	1	16.67	29	35.6	3	54.15	30	2.4	3	33.95	32	39.1	0
16.7	9.62	29	71.2	3	16.95	28	36.3	7	54.43	28	3.0	6	34.26	31	39.1	0
26.6	9.90	28	70.7	5	17.22	27	37.2	9	54.70	27	3.8	8	34.56	30	39.1	0
ov. 5.6	10.16	26	70.1	6	17.47	25	38.5	13	54.96	26	4.9	11	34.85	29	38.9	2
15.6	10.40	24	69.3	8	17.70	23	40.0	15	55.19	23	6.2	13	35.11	26	38.8	1
25.6	10.62	22	68.5	8	17.90	20	41.6	16	55.40	21	7.6	14	35.34	23	38.6	2
ec. 5.5	10.80	18	67.6	9	18.08	18	43.4	18	55.57	17	9.1	15	35.55	21	38.4	2
15.5	10.95	15	66.8	8	18.21	13	45.2	18	55.71	14	10.6	15	35.71	16	38.2	2
25.5	11.06	11	66.0	8	18.30	9	46.9	17	55.81	10	12.0	14	35.83	12	38.1	1
35.4	11.12	6	65.2	8	18.36	6	48.5	16	55.86	5	13.4	14	35.90	7	38.1	0
c δ, Tan δ	1.014		+0.166		1.005		−0.104		1.000		−0.022		1.072		+0.386	
an Place	$5^{s}.900$		$55''.58$		$13^{s}.556$		$56''.17$		$50^{s}.945$		$21''.56$		$30^{s}.265$		$27''.32$	
$'_{\psi}a$, $D_{\omega}a$	0.00		0.00		0.00		0.00		0.00		0.00		+0.01		0.00	
$_{\psi}\delta$, $D_{\omega}\delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Orionis. Mag. 2.0				α Columbæ. Mag. 2.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 5 36		° ′ − 1 58		h m 5 36		° ′ −34 6	
	s		″		s		″	
Jan. 0.5	26.69		67.7		33.89		65.6	
10.4	26.73	4	69.0	13	33.87	2	68.3	27
20.4	26.72	1	70.2	12	33.80	7	70.8	25
30.4	26.66	6	71.2	10	33.68	12	72.9	21
Feb. 9.3	26.57	9	72.1	9	33.53	15	74.7	18
19.3	26.44	13	72.7	6	33.34	19	76.0	13
Mar. 1.3	26.29	15	73.1	4	33.12	22	76.9	9
11.3	26.12	17	73.4	3	32.88	24	77.3	4
21.2	25.95	17	73.4	0	32.64	24	77.3	0
31.2	25.79	16	73.3	1	32.41	23	76.8	5
Apr. 10.2	25.64	15	73.0	3	32.20	21	75.9	9
20.2	25.52	12	72.4	6	32.01	19	74.7	12
30.1	25.42	10	71.7	7	31.86	15	73.0	17
May 10.1	25.36	6	70.8	9	31.74	12	70.9	21
20.1	25.34	2	69.8	10	31.67	7	68.6	23
30.0	25.37	3	68.6	12	31.65	2	66.1	25
June 9.0	25.44	7	67.2	14	31.67	2	63.3	28
19.0	25.54	10	65.7	15	31.74	7	60.4	29
29.0	25.69	15	64.2	15	31.86	12	57.5	29
July 8.9	25.87	18	62.7	15	32.02	16	54.6	29
18.9	26.08	21	61.2	15	32.23	21	51.9	27
28.9	26.31	23	59.7	15	32.46	23	49.3	26
Aug. 7.9	26.57	26	58.4	13	32.72	26	47.1	22
17.8	26.84	27	57.3	11	33.01	29	45.2	19
27.8	27.13	29	56.4	9	33.32	31	43.7	15
Sept. 6.8	27.42	29	55.7	7	33.64	32	42.7	10
16.7	27.72	30	55.4	3	33.97	33	42.3	4
26.7	28.01	29	55.3	1	34.29	32	42.4	1
Oct. 6.7	28.31	30	55.6	3	34.61	32	43.1	7
16.7	28.59	28	56.2	6	34.92	31	44.3	12
26.6	28.87	28	57.1	9	35.21	29	46.0	17
Nov. 5.6	29.12	25	58.2	11	35.48	27	48.2	22
15.6	29.36	24	59.5	13	35.72	24	50.7	25
25.6	29.57	21	60.9	14	35.92	20	53.5	28
Dec. 5.5	29.75	18	62.5	16	36.09	17	56.5	30
15.5	29.89	14	64.1	16	36.20	11	59.6	31
25.5	30.00	11	65.6	15	36.27	7	62.6	30
35.4	30.06	6	67.0	14	36.28	1	65.5	29
Sec δ, Tan δ	1.001		−0.035		1.208		−0.677	
Mean Place	25ˢ.146		74″.59		32ˢ.092		70″.01	
D′ψ α, Dω α	0.00		0.00		−0.02		0.00	
Dψ δ, Dω δ	0.0		+1.0		0.0		+1.0	

Mean Solar Date.	ο Aurigæ. Mag. 5.5				ζ Leporis. Mag. 3.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 5 39		° ′ +49 47		h m 5 43		° ′ −14 50	
	s		″		s		″	
Jan. 0.5	16.51		34.5		5.08		65.8	
10.4	16.56	5	36.1	16	5.10	2	67.8	20
20.4	16.54	2	37.7	16	5.08	2	69.6	18
30.4	16.46	8	39.1	14	5.02	6	71.2	16
Feb. 9.3	16.31	15	40.2	11	4.91	11	72.5	13
19.3	16.12	19	41.1	9	4.77	14	73.5	10
Mar. 1.3	15.89	23	41.7	6	4.61	16	74.2	7
11.3	15.63	26	42.0	3	4.43	18	74.6	4
21.2	15.36	27	41.9	1	4.24	19	74.6	0
31.2	15.11	25	41.5	4	4.06	18	74.4	2
Apr. 10.2	14.88	23	40.8	7	3.90	16	73.8	6
20.2	14.68	20	39.8	10	3.75	15	73.0	8
30.1	14.53	15	38.6	12	3.64	11	71.9	11
May 10.1	14.44	9	37.2	14	3.56	8	70.5	14
20.1	14.41	3	35.7	15	3.52	4	68.9	16
30.0	14.44	3	34.1	16	3.53	1	67.1	18
June 9.0	14.54	10	32.6	15	3.58	5	65.1	20
19.0	14.70	16	31.0	16	3.67	9	63.0	21
29.0	14.92	22	29.6	14	3.80	13	60.9	21
July 8.9	15.19	27	28.3	13	3.96	16	58.8	21
18.9	15.51	32	27.1	12	4.16	20	56.7	21
28.9	15.87	36	26.2	9	4.38	22	54.7	20
Aug. 7.9	16.26	39	25.4	8	4.63	25	53.0	17
17.8	16.68	42	24.8	6	4.90	27	51.5	15
27.8	17.12	44	24.4	4	5.18	28	50.3	12
Sept. 6.8	17.57	45	24.2	2	5.47	29	49.5	8
16.7	18.03	46	24.2	0	5.77	30	49.1	4
26.7	18.49	46	24.4	2	6.07	30	49.1	0
Oct. 6.7	18.94	45	24.8	4	6.36	29	49.5	4
16.7	19.38	44	25.5	7	6.65	29	50.4	9
26.6	19.81	43	26.3	8	6.93	28	51.6	12
Nov. 5.6	20.21	40	27.3	10	7.19	26	53.2	16
15.6	20.58	37	28.4	11	7.42	23	55.1	19
25.6	20.91	33	29.7	13	7.63	21	57.2	21
Dec. 5.5	21.19	28	31.2	15	7.81	18	59.4	22
15.5	21.42	23	32.8	16	7.95	14	61.7	23
25.5	21.58	16	34.4	16	8.04	9	63.9	22
35.4	21.68	10	36.0	16	8.09	5	66.0	21
Sec δ, Tan δ	1.549		+1.183		1.035		−0.265	
Mean Place	14ˢ.172		23″.04		3ˢ.490		71″.74	
D′ψ α, Dω α	+0.03		−0.01		−0.01		0.00	
Dψ δ, Dω δ	0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	κ Orionis. Mag. 2.2				δ Doradus. Mag. 4.5				ν Aurigæ. Mag. 4.2				δ Leporis. Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 5 43		° ′ − 9 41		h m 5 44		° ′ −65 45		h m 5 45		° ′ +39 7		h m 5 47		° ′ −20 52	
	s		″		s		″		s		″		s		″	
Jan. 0.5	42.22		51.6		40.33		60.3		33.73		38.1		38.98		62.8	
10.4	42.25	3	53.4	18	40.15	18	63.6	33	33.79	6	39.2	11	39.00	2	65.1	23
20.4	42.23	2	54.9	15	39.87	28	66.6	30	33.79	0	40.2	10	38.97	3	67.2	21
30.4	42.18	5	56.3	14	39.51	36	69.2	26	33.74	5	41.1	9	38.90	7	69.0	18
Feb. 9.4	42.08	10	57.4	11	39.07	44	71.3	21	33.63	11	41.9	8	38.79	11	70.6	16
19.3	41.95	13	58.3	9	38.57	50	73.0	17	33.48	15	42.5	6	38.64	15	71.8	12
Mar. 1.3	41.79	16	58.9	6	38.03	54	74.1	11	33.30	18	42.9	4	38.46	18	72.6	8
11.3	41.62	17	59.2	3	37.47	56	74.7	6	33.09	21	43.1	2	38.27	19	73.1	5
21.2	41.44	18	59.3	1	36.90	57	74.7	0	32.88	21	43.1	0	38.08	19	73.2	1
31.2	41.27	17	59.1	2	36.34	56	74.2	5	32.67	21	42.8	3	37.89	19	72.9	3
Apr. 10.2	41.11	16	58.7	4	35.80	54	73.2	10	32.48	19	42.4	4	37.71	18	72.3	6
20.2	40.98	13	58.0	7	35.30	50	71.6	16	32.32	16	41.7	7	37.55	16	71.4	9
30.1	40.87	11	57.0	10	34.86	44	69.6	20	32.20	12	40.9	8	37.42	13	70.1	13
May 10.1	40.80	7	55.8	12	34.49	37	67.2	24	32.12	8	40.0	9	37.33	9	68.6	15
20.1	40.77	3	54.4	14	34.19	30	64.5	27	32.10	2	39.0	10	37.28	5	66.8	18
30.1	40.78	1	52.8	16	33.98	21	61.5	30	32.13	3	38.0	10	37.28	0	64.8	20
June 9.0	40.83	5	51.1	17	33.86	12	58.2	33	32.21	8	37.0	10	37.31	3	62.6	22
19.0	40.93	10	49.3	18	33.83	3	54.9	33	32.35	14	36.0	10	37.39	8	60.3	23
29.0	41.06	13	47.4	19	33.89	6	51.5	34	32.54	19	35.2	8	37.51	12	57.9	24
July 8.9	41.22	16	45.5	19	34.03	14	48.1	34	32.77	23	34.4	8	37.67	16	55.5	24
18.9	41.42	20	43.7	18	34.27	24	44.9	32	33.04	27	33.7	7	37.86	19	53.2	23
28.9	41.65	23	41.9	18	34.59	32	41.9	30	33.34	30	33.2	5	38.08	22	51.1	21
Aug. 7.9	41.89	24	40.3	16	34.98	39	39.3	26	33.67	33	32.8	4	38.33	25	49.2	19
17.8	42.16	27	39.0	13	35.43	45	37.1	22	34.02	35	32.4	4	38.59	26	47.5	17
27.8	42.44	28	37.9	11	35.93	50	35.3	18	34.39	37	32.2	2	38.88	29	46.2	13
Sept. 6.8	42.73	29	37.2	7	36.46	53	34.2	11	34.78	39	32.1	1	39.17	29	45.3	9
16.8	43.03	30	36.8	4	37.02	56	33.7	5	35.16	38	32.2	1	39.47	30	44.9	4
26.7	43.33	30	36.8	0	37.59	57	33.8	1	35.55	39	32.3	1	39.78	31	44.9	0
Oct. 6.7	43.62	29	37.1	3	38.15	56	34.6	8	35.94	39	32.5	2	40.08	30	45.4	5
16.7	43.91	29	37.9	8	38.68	53	36.0	14	36.32	38	32.8	3	40.37	29	46.4	10
26.6	44.18	27	39.0	11	39.17	49	38.0	20	36.68	36	33.2	4	40.65	28	47.8	14
Nov. 5.6	44.44	26	40.4	14	39.60	43	40.5	25	37.03	35	33.7	5	40.92	27	49.6	18
15.6	44.68	24	42.1	17	39.97	37	43.5	30	37.35	32	34.4	7	41.16	24	51.7	21
25.6	44.89	21	43.9	18	40.25	28	46.9	34	37.64	29	35.1	7	41.37	21	54.1	24
Dec. 5.5	45.07	18	45.9	20	40.43	18	50.4	35	37.89	25	35.9	8	41.55	18	56.6	25
15.5	45.21	14	47.9	20	40.52	9	54.1	37	38.10	21	36.8	9	41.69	14	59.2	26
25.5	45.32	11	49.9	20	40.50	2	57.7	36	38.25	15	37.8	10	41.79	10	61.8	26
35.5	45.38	6	51.8	19	40.38	12	61.2	35	38.35	10	38.8	10	41.84	5	64.2	24
Sec δ, Tan δ	1.015		−0.171		2.436		−2.222		1.289		+0.813		1.070		−0.382	
Mean Place	40ˢ.651		57″.91		37ˢ.006		64″.03		31ˢ.726		27″.88		37ˢ.345		68″.40	
D′ψa, Dωa	0.00		0.00		−0.06		+0.01		+0.02		0.00		−0.01		0.00	
Dψδ, Dωδ	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Orionis. Var. 1.0–1.4 Right Ascension.		α Orionis. Declination N.		δ Aurigæ. Mag. 3.9 Right Ascension.		δ Aurigæ. Declination N.		η Leporis. Mag. 3.8 Right Ascension.		η Leporis. Declination S.		β Aurigæ. Mag. 2.1 Right Ascension.		β Aurigæ. Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 50		+ 7 23		5 52		+54 16		5 52		−14 10		5 53		+44 56	
	s		″		s		″		s		″		s		″	
Jan. 0.5	32.53		38.4		29.45		56.9		30.85		51.5		15.47		33.6	
10.4	32.58	5	37.6	8	29.52	7	58.7	18	30.89	4	53.5	20	15.54	7	35.0	14
20.4	32.59	1	36.8	8	29.51	1	60.5	18	30.88	1	55.3	18	15.55	1	36.3	13
30.4	32.55	4	36.2	6	29.43	8	62.2	17	30.82	6	56.9	16	15.49	6	37.6	13
Feb. 9.4	32.47	8	35.7	5	29.28	15	63.6	14	30.72	10	58.3	14	15.38	11	38.6	10
19.3	32.35	12	35.3	4	29.07	21	64.7	11	30.59	13	59.3	10	15.21	17	39.5	9
Mar. 1.3	32.21	14	35.0	3	28.81	26	65.5	8	30.43	16	60.0	7	15.01	20	40.1	6
11.3	32.05	16	34.8	2	28.53	28	66.0	5	30.25	18	60.5	5	14.78	23	40.4	3
21.3	31.88	17	34.7	1	28.23	30	66.1	1	30.07	18	60.6	1	14.55	23	40.5	1
31.2	31.72	16	34.8	1	27.94	29	65.8	3	29.89	18	60.4	2	14.31	24	40.2	3
Apr. 10.2	31.57	15	34.9	1	27.67	27	65.1	7	29.72	17	59.9	5	14.10	21	39.7	5
20.2	31.44	13	35.2	3	27.44	23	64.1	10	29.57	15	59.1	8	13.92	18	39.0	7
30.1	31.34	10	35.5	3	27.26	18	62.8	13	29.45	12	58.0	11	13.77	15	38.0	10
May 10.1	31.28	6	36.0	5	27.14	12	61.3	15	29.37	8	56.7	13	13.68	9	36.9	11
20.1	31.26	2	36.6	6	27.08	6	59.7	16	29.33	4	55.2	15	13.64	4	35.7	12
30.1	31.28	2	37.3	7	27.09	1	57.9	18	29.33	0	53.5	17	13.65	1	34.4	13
June 9.0	31.34	6	38.1	8	27.17	8	56.1	18	29.37	4	51.6	19	13.73	8	33.0	14
19.0	31.44	10	39.0	9	27.32	15	54.3	18	29.45	8	49.6	20	13.87	14	31.7	13
29.0	31.58	14	39.9	9	27.53	21	52.6	17	29.57	12	47.5	21	14.06	19	30.5	12
July 8.9	31.76	18	40.9	10	27.81	28	51.0	16	29.72	15	45.4	21	14.29	23	29.4	11
18.9	31.97	21	41.9	10	28.14	33	49.5	15	29.91	19	43.3	21	14.57	28	28.3	11
28.9	32.20	23	42.9	10	28.51	37	48.2	13	30.13	22	41.4	19	14.90	33	27.4	9
Aug. 7.9	32.46	26	43.8	9	28.92	41	47.1	11	30.37	24	39.7	17	15.25	35	26.7	7
17.8	32.73	27	44.6	8	29.37	45	46.2	9	30.63	26	38.2	15	15.62	37	26.1	6
27.8	33.02	29	45.2	6	29.84	47	45.5	7	30.91	28	37.0	12	16.02	40	25.7	4
Sept. 6.8	33.31	29	45.7	5	30.33	49	45.1	4	31.20	29	36.2	8	16.43	41	25.4	3
16.8	33.62	31	46.0	3	30.83	50	44.9	2	31.50	30	35.7	5	16.85	42	25.3	1
26.7	33.92	30	46.0	0	31.33	50	44.9	0	31.79	29	35.7	0	17.27	42	25.3	0
Oct. 6.7	34.22	30	45.8	2	31.83	50	45.2	3	32.09	30	36.1	4	17.69	42	25.5	2
16.7	34.52	30	45.4	4	32.33	50	45.7	5	32.38	29	37.0	9	18.11	42	25.8	3
26.6	34.81	29	44.8	6	32.81	48	46.4	7	32.66	28	38.2	12	18.51	40	26.3	5
Nov. 5.6	35.08	27	44.0	8	33.26	45	47.4	10	32.93	27	39.7	15	18.89	38	27.0	7
15.6	35.34	26	43.0	10	33.68	42	48.6	12	33.17	24	41.6	19	19.25	36	27.8	8
25.6	35.57	23	42.0	10	34.05	37	50.1	15	33.39	22	43.7	21	19.57	32	28.8	10
Dec. 5.5	35.77	20	40.9	11	34.37	32	51.7	16	33.57	18	45.9	22	19.85	28	29.9	11
15.5	35.94	17	39.9	10	34.64	27	53.4	17	33.72	15	48.1	22	20.08	23	31.1	12
25.5	36.06	12	38.9	10	34.83	19	55.2	18	33.83	11	50.4	23	20.25	17	32.4	13
35.5	36.14	8	37.9	10	34.95	12	57.1	19	33.89	6	52.5	21	20.36	11	33.7	13
Sec δ, Tan δ	1.008		+0.130		1.713		+1.391		1.031		−0.253		1.413		+0.998	
Mean Place	30ˢ.939		30″.83		26ˢ.811		46″.08		29ˢ.264		57″.64		13ˢ.258		23″.48	
D′ψ a, Dω a	0.00		0.00		+0.04		0.00		−0.01		0.00		+0.03		0.00	
Dψ δ, Dω δ	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Aurigæ. Mag. 2.7				1 Geminorum. Mag. 4.3				1 Puppis (G.). Mag. 6.2				ν Orionis. Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 53		+37 12		5 58		+23 16		6 1		−45 1		6 2		+14 46	
	s		″		s		″		s		″		s		″	
Jan. 0.5	53.39		36.9		55.30		16.3		61.94		64.7		41.39		54.4	
10.4	53.46	7	37.8	9	55.37	7	16.4	1	61.92	2	67.9	32	41.46	7	53.9	5
20.4	53.47	1	38.7	9	55.39	2	16.5	1	61.84	8	70.8	29	41.48	2	53.6	3
30.4	53.43	4	39.6	9	55.36	3	16.7	2	61.70	14	73.4	26	41.45	3	53.3	3
Feb. 9.4	53.34	9	40.3	7	55.29	7	16.8	1	61.51	19	75.6	22	41.38	7	53.1	2
19.3	53.20	14	40.9	6	55.17	12	17.0	2	61.28	23	77.3	17	41.27	11	53.0	1
Mar. 1.3	53.02	18	41.3	4	55.02	15	17.1	1	61.02	26	78.6	13	41.13	14	52.8	2
11.3	52.82	20	41.5	2	54.86	16	17.2	1	60.73	29	79.4	8	40.97	16	52.8	0
21.3	52.62	20	41.6	1	54.68	18	17.2	0	60.44	29	79.7	3	40.80	17	52.8	0
31.2	52.42	20	41.4	2	54.51	17	17.1	1	60.15	29	79.4	3	40.64	16	52.8	0
Apr. 10.2	52.23	19	41.0	4	54.35	16	17.0	1	59.87	28	78.7	7	40.48	16	52.8	0
20.2	52.07	16	40.5	5	54.21	14	16.8	2	59.61	26	77.5	12	40.35	13	52.8	0
30.1	51.95	12	39.8	7	54.10	11	16.6	2	59.39	22	75.9	16	40.24	11	52.9	1
May 10.1	51.87	8	39.0	8	54.03	7	16.4	2	59.20	19	73.9	20	40.18	6	53.1	2
20.1	51.84	3	38.1	9	54.01	2	16.2	2	59.07	13	71.5	24	40.15	3	53.3	2
30.1	51.86	2	37.2	9	54.03	2	16.0	2	58.98	9	68.8	27	40.16	1	53.6	3
June 9.0	51.93	7	36.3	9	54.09	6	15.9	1	58.95	3	65.9	29	40.22	6	54.0	4
19.0	52.06	13	35.4	9	54.20	11	15.9	0	58.97	2	62.9	30	40.31	9	54.4	4
29.0	52.23	17	34.6	8	54.35	15	15.9	0	59.05	8	59.7	32	40.45	14	54.9	5
July 9.0	52.45	22	33.9	7	54.53	18	15.9	0	59.18	13	56.6	31	40.62	17	55.4	5
18.9	52.70	25	33.3	6	54.75	22	16.0	1	59.36	18	53.6	30	40.83	21	56.0	6
28.9	52.99	29	32.8	5	55.00	25	16.2	2	59.58	22	50.7	29	41.06	23	56.5	5
Aug. 7.9	53.31	32	32.3	5	55.28	28	16.3	1	59.84	26	48.1	26	41.32	26	57.0	5
17.8	53.65	34	32.0	3	55.57	29	16.5	2	60.13	29	45.9	22	41.59	27	57.5	5
27.8	54.01	36	31.8	2	55.88	31	16.6	1	60.45	32	44.2	17	41.88	29	57.9	4
Sept. 6.8	54.38	37	31.7	1	56.20	32	16.7	1	60.79	34	42.9	13	42.19	31	58.1	2
16.8	54.76	38	31.6	1	56.53	33	16.7	0	61.15	36	42.2	7	42.50	31	58.2	1
26.7	55.13	37	31.6	0	56.86	33	16.7	0	61.52	37	42.1	1	42.81	31	58.2	0
Oct. 6.7	55.51	38	31.7	1	57.19	33	16.6	1	61.88	36	42.7	6	43.13	32	58.0	2
16.7	55.88	37	31.9	2	57.52	33	16.5	1	62.24	36	43.9	12	43.44	31	57.7	3
26.7	56.25	37	32.1	2	57.84	32	16.3	2	62.58	34	45.6	17	43.74	30	57.2	5
Nov. 5.6	56.59	34	32.5	4	58.14	30	16.1	2	62.89	31	47.8	22	44.03	29	56.7	5
15.6	56.92	33	32.9	4	58.43	29	15.8	3	63.17	28	50.5	27	44.31	28	56.0	7
25.6	57.21	29	33.5	6	58.69	26	15.6	2	63.41	24	53.5	30	44.56	25	55.3	7
Dec. 5.5	57.46	25	34.2	7	58.92	23	15.4	2	63.61	20	56.8	33	44.78	22	54.6	7
15.5	57.67	21	34.9	7	59.11	19	15.3	1	63.75	14	60.2	34	44.96	18	54.0	6
25.5	57.84	17	35.7	8	59.26	15	15.2	1	63.83	8	63.7	35	45.11	15	53.4	6
35.5	57.95	11	36.6	9	59.37	11	15.2	0	63.85	2	67.0	33	45.21	10	52.8	6
Sec δ, Tan δ	1.256		+0.759		1.089		+0.430		1.415		−1.001		1.034		+0.264	
Mean Place	51ˢ.410		27″.25		53ˢ.563		7″.89		59ˢ.905		69″.94		39ˢ.731		46″.59	
D′ψα, Dωα	+0.02		0.00		+0.01		0.00		−0.03		0.00		+0.01		0.00	
Dψδ, Dωδ	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	22 H. Camelop. Mag. 4.7				η Geminorum. Var. 3.2–4.2				2 Lyncis. Mag. 4.4				ζ Canis Majoris. Mag. 3.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 6 9		° ′ +69 20		h m 6 9		° ′ +22 31		h m 6 12		° ′ +59 2		h m 6 17		° ′ −30 1	
	s		″		s		″		s		″		s		″	
Jan. 0.5	26.77		76.4		42.98		65.5		5.39		46.1		2.34		23.3	
10.5	26.87	10	79.0	26	43.06	8	65.5	0	5.50	11	48.2	21	2.38	4	26.1	28
20.4	26.85	2	81.5	25	43.09	3	65.6	1	5.51	1	50.3	21	2.36	2	28.7	26
30.4	26.70	15	83.8	23	43.07	2	65.7	1	5.44	7	52.2	19	2.29	7	31.0	23
Feb. 9.4	26.43	27	85.9	21	43.00	7	65.8	1	5.29	15	53.9	17	2.18	11	33.1	21
19.3	26.07	36	87.6	17	42.89	11	66.0	2	5.06	23	55.4	15	2.02	16	34.7	16
Mar. 1.3	25.63	44	88.9	13	42.75	14	66.1	1	4.78	28	56.5	11	1.84	18	35.9	12
11.3	25.14	49	89.7	8	42.59	16	66.2	1	4.46	32	57.2	7	1.63	21	36.7	8
21.3	24.62	52	90.1	4	42.42	17	66.3	1	4.12	34	57.5	3	1.41	22	37.1	4
31.2	24.10	52	89.9	2	42.24	18	66.3	0	3.78	34	57.4	1	1.19	22	37.0	1
Apr. 10.2	23.60	50	89.2	7	42.08	16	66.2	1	3.46	32	56.9	5	0.98	21	36.6	4
20.2	23.16	44	88.1	11	41.94	14	66.1	1	3.17	29	56.0	9	0.79	19	35.7	9
30.2	22.79	37	86.5	16	41.82	12	65.9	2	2.93	24	54.7	13	0.62	17	34.5	12
May 10.1	22.50	29	84.7	18	41.75	7	65.8	1	2.76	17	53.2	15	0.49	13	32.9	16
20.1	22.31	19	82.5	22	41.71	4	65.6	2	2.65	11	51.4	18	0.40	9	31.0	19
30.1	22.24	7	80.2	23	41.72	1	65.5	1	2.62	3	49.5	19	0.34	6	28.8	22
June 9.0	22.27	3	77.7	25	41.77	5	65.4	1	2.67	5	47.5	20	0.33	1	26.4	24
19.0	22.41	14	75.2	25	41.87	10	65.4	0	2.79	12	45.4	21	0.37	4	23.8	26
29.0	22.66	25	72.7	25	42.01	14	65.4	0	2.99	20	43.4	20	0.45	8	21.2	26
July 9.0	23.02	36	70.3	24	42.18	17	65.4	0	3.25	26	41.5	19	0.57	12	18.5	27
18.9	23.47	45	68.0	23	42.39	21	65.5	1	3.58	33	39.6	19	0.73	16	15.9	26
28.9	24.00	53	66.0	20	42.63	24	65.6	1	3.97	39	37.9	17	0.93	20	13.4	25
Aug. 7.9	24.60	60	64.2	18	42.90	27	65.7	1	4.41	44	36.5	14	1.16	23	11.1	23
17.9	25.27	67	62.6	16	43.18	28	65.9	2	4.88	47	35.2	13	1.41	25	9.2	19
27.8	25.99	72	61.3	13	43.48	30	66.0	1	5.39	51	34.1	11	1.69	28	7.6	16
Sept. 6.8	26.75	76	60.4	9	43.80	32	66.0	0	5.92	53	33.3	8	1.98	29	6.4	12
16.8	27.53	78	59.8	6	44.12	32	66.0	0	6.48	56	32.8	5	2.29	31	5.7	7
26.7	28.33	80	59.6	2	44.45	33	65.9	1	7.04	56	32.6	2	2.61	32	5.6	1
Oct. 6.7	29.13	80	59.7	1	44.78	33	65.7	2	7.61	57	32.6	0	2.93	32	6.0	4
16.7	29.92	79	60.2	5	45.11	33	65.5	2	8.17	56	32.9	3	3.25	32	7.0	10
26.7	30.69	77	61.0	8	45.43	32	65.2	3	8.72	55	33.5	6	3.55	30	8.4	14
Nov. 5.6	31.42	73	62.2	12	45.74	31	64.8	4	9.24	52	34.4	9	3.84	29	10.3	19
15.6	32.10	68	63.8	16	46.03	29	64.5	3	9.73	49	35.6	12	4.11	27	12.6	23
25.6	32.71	61	65.7	19	46.30	27	64.2	3	10.18	45	37.0	14	4.36	25	15.3	27
Dec. 5.6	33.23	52	67.8	21	46.55	25	63.9	3	10.57	39	38.7	17	4.56	20	18.2	29
15.5	33.65	42	70.2	24	46.75	20	63.7	2	10.89	32	40.5	18	4.72	16	21.2	30
25.5	33.95	30	72.7	25	46.91	16	63.5	2	11.13	24	42.5	20	4.84	12	24.2	30
35.5	34.13	18	75.3	26	47.02	11	63.4	1	11.29	16	44.6	21	4.91	7	27.1	29
Sec δ, Tan δ	2.836		+2.654		1.083		+0.415		1.944		+1.667		1.155		−0.578	
Mean Place	$22^{s}.370$		66″.31		$41^{s}.230$		57″.53		$2^{s}.308$		36″.62		$0^{s}.624$		29″.48	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.07		+0.01		+0.01		0.00		+0.05		+0.01		−0.02		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**μ Geminorum.** Mag. 3.2				**ψ¹ Aurigæ.** Mag. 5.1				**β Canis Majoris.** Mag. 2.0				**8 Monocerotis.** Mag. 4.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 6 17		° ′ +22 33		h m 6 18		° ′ +49 19		h m 6 18		° ′ −17 54		h m 6 19		° ′ + 4 38	
	s		″		s		″		s		″		s		″	
Jan. 0.5	47.26		38.9		19.15		67.4		56.34		38.3		14.29		21.5	
10.5	47.35	9	38.9	0	19.26	11	69.0	16	56.40	6	40.6	23	14.37	8	20.4	11
20.4	47.39	4	39.0	1	19.29	3	70.6	16	56.40	0	42.7	21	14.40	3	19.5	9
30.4	47.37	2	39.1	1	19.26	3	72.1	15	56.36	4	44.6	19	14.38	2	18.6	9
Feb. 9.4	47.31	6	39.3	2	19.16	10	73.5	14	56.28	8	46.2	16	14.32	6	17.9	7
19.3	47.21	10	39.4	1	19.00	16	74.7	12	56.16	12	47.5	13	14.22	10	17.4	5
Mar. 1.3	47.07	14	39.6	2	18.79	21	75.6	9	56.00	16	48.5	10	14.09	13	17.1	3
11.3	46.91	16	39.7	1	18.55	24	76.3	7	55.82	18	49.1	6	13.94	15	16.8	3
21.3	46.74	17	39.8	1	18.29	26	76.6	3	55.63	19	49.4	3	13.78	16	16.7	1
31.2	46.57	17	39.8	0	18.03	26	76.5	1	55.44	19	49.4	0	13.61	17	16.8	1
Apr. 10.2	46.40	17	39.7	1	17.79	24	76.2	3	55.26	18	49.0	4	13.45	16	16.9	1
20.2	46.25	15	39.6	1	17.57	22	75.5	7	55.10	16	48.4	6	13.31	14	17.2	3
30.2	46.14	11	39.5	1	17.39	18	74.6	9	54.97	13	47.4	10	13.20	11	17.6	4
May 10.1	46.06	8	39.4	1	17.26	13	73.4	12	54.86	11	46.1	13	13.12	8	18.2	6
20.1	46.02	4	39.3	1	17.18	8	72.1	13	54.79	7	44.6	15	13.07	5	18.8	6
30.1	46.02	0	39.1	2	17.17	1	70.6	15	54.76	3	42.8	18	13.07	0	19.6	8
June 9.0	46.06	4	39.0	1	17.21	4	69.1	15	54.77	1	40.9	19	13.10	3	20.5	9
19.0	46.15	9	38.9	1	17.31	10	67.5	16	54.83	6	38.8	21	13.18	8	21.4	9
29.0	46.28	13	38.9	0	17.48	17	66.0	15	54.92	9	36.6	22	13.29	11	22.4	10
July 9.0	46.45	17	38.9	0	17.70	22	64.5	15	55.05	13	34.4	22	13.44	15	23.5	11
18.9	46.65	20	39.0	1	17.96	26	63.1	14	55.21	16	32.3	21	13.62	18	24.5	10
28.9	46.88	23	39.1	1	18.28	32	61.8	13	55.41	20	30.2	21	13.83	21	25.5	10
Aug. 7.9	47.14	26	39.1	0	18.63	35	60.6	12	55.63	22	28.4	18	14.06	23	26.5	10
17.9	47.42	28	39.2	1	19.01	38	59.6	10	55.87	24	26.8	16	14.31	25	27.3	8
27.8	47.72	30	39.2	0	19.42	41	58.7	9	56.14	27	25.5	13	14.58	27	27.9	6
Sept. 6.8	48.03	31	39.2	0	19.85	43	58.0	7	56.42	28	24.5	10	14.86	28	28.3	4
16.8	48.36	33	39.1	1	20.29	44	57.5	5	56.71	29	24.0	5	15.16	30	28.5	2
26.7	48.68	32	38.9	2	20.74	45	57.2	3	57.01	30	23.9	1	15.46	30	28.4	1
Oct. 6.7	49.01	33	38.7	2	21.20	46	57.1	1	57.31	30	24.3	4	15.76	30	28.1	3
16.7	49.35	34	38.4	3	21.66	46	57.2	1	57.61	30	25.1	8	16.06	30	27.5	6
26.7	49.67	32	38.0	4	22.11	45	57.5	3	57.91	30	26.4	13	16.36	30	26.7	8
Nov. 5.6	49.99	32	37.6	4	22.54	43	58.0	5	58.19	28	28.0	16	16.65	29	25.7	10
15.6	50.29	30	37.2	4	22.95	41	58.8	8	58.46	27	30.0	20	16.92	27	24.6	11
25.6	50.56	27	36.9	3	23.32	37	59.7	9	58.70	24	32.2	22	17.17	25	23.3	13
Dec. 5.6	50.81	25	36.5	4	23.65	33	60.9	12	58.90	20	34.6	24	17.39	22	22.0	13
15.5	51.02	21	36.3	2	23.93	28	62.2	13	59.07	17	37.2	26	17.58	19	20.7	13
25.5	51.19	17	36.1	2	24.15	22	63.6	14	59.20	13	39.7	25	17.73	15	19.4	13
35.5	51.31	12	36.0	1	24.30	15	65.2	16	59.29	9	42.1	24	17.84	11	18.2	12
Sec δ, Tan δ	1.083		+0.415		1.535		+1.164		1.051		−0.323		1.003		+0.081	
Mean Place	45ˢ.494		31″.32		16ˢ.660		58″.85		54ˢ.730		44″.72		12ˢ.684		14″.57	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.01		0.00		+0.03		+0.01		−0.01		0.00		0.00		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Argûs. Mag. −0.9				10 Monocerotis. Mag. 5.0				ν Geminorum. Mag. 4.1				8 Lyncis. Mag. 6.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 6 22		° ′ −52 38		h m 6 23		° ′ − 4 42		h m 6 23		° ′ +20 16		h m 6 29		° ′ +61 33	
	s		″		s		″		s		″		s		″	
Jan. 0.5	4.84	2	47.9	35	44.41	8	22.6	17	53.16	9	10.3	1	53.54	14	37.5	22
10.5	4.82	9	51.4	32	44.49	2	24.3	15	53.25	4	10.2	1	53.68	5	39.7	22
20.4	4.73	15	54.6	29	44.51	2	25.8	13	53.29	0	10.1	0	53.73	6	41.9	21
30.4	4.58	22	57.5	26	44.49	6	27.1	11	53.29	6	10.1	1	53.67	14	44.0	20
Feb. 9.4	4.36	27	60.1	20	44.43	10	28.2	9	53.23	10	10.2	1	53.53	22	46.0	16
19.4	4.09	31	62.1	16	44.33	14	29.1	6	53.13	13	10.3	1	53.31	29	47.6	14
Mar. 1.3	3.78	34	63.7	11	44.19	16	29.7	4	53.00	15	10.4	1	53.02	34	49.0	9
11.3	3.44	35	64.8	6	44.03	17	30.1	2	52.85	17	10.5	0	52.68	37	49.9	5
21.3	3.09	36	65.4	1	43.86	17	30.3	0	52.68	18	10.5	1	52.31	37	50.4	1
31.2	2.73	35	65.5	5	43.69	16	30.3	2	52.50	16	10.6	0	51.94	36	50.5	4
Apr. 10.2	2.38	32	65.0	10	43.53	15	30.1	5	52.34	14	10.6	0	51.58	33	50.1	8
20.2	2.06	29	64.0	14	43.38	12	29.6	6	52.20	12	10.6	1	51.25	28	49.3	11
30.2	1.77	26	62.6	19	43.26	9	29.0	9	52.08	9	10.5	0	50.97	22	48.2	15
May 10.1	1.51	20	60.7	23	43.17	5	28.1	10	51.99	4	10.5	0	50.75	15	46.7	18
20.1	1.31	15	58.4	26	43.12	2	27.1	12	51.95	0	10.5	1	50.60	8	44.9	19
30.1	1.16	9	55.8	29	43.10	2	25.9	13	51.95	3	10.4	1	50.52	1	43.0	21
June 9.1	1.07	2	52.9	31	43.12	7	24.6	15	51.98	8	10.5	0	50.53	10	40.9	22
19.0	1.05	3	49.8	32	43.19	10	23.1	15	52.06	12	10.5	1	50.63	17	38.7	22
29.0	1.08	9	46.6	32	43.29	13	21.6	15	52.18	16	10.6	1	50.80	24	36.5	22
July 9.0	1.17	15	43.4	32	43.42	17	20.1	15	52.34	20	10.7	2	51.04	32	34.3	21
18.9	1.32	21	40.2	30	43.59	20	18.6	15	52.54	22	10.9	2	51.36	38	32.2	19
28.9	1.53	26	37.2	28	43.79	22	17.1	13	52.76	25	11.1	1	51.74	44	30.3	18
Aug. 7.9	1.79	30	34.4	24	44.01	24	15.8	12	53.01	27	11.2	1	52.18	48	28.5	16
17.9	2.09	34	32.0	20	44.25	27	14.6	9	53.28	29	11.3	1	52.66	52	26.9	13
27.8	2.43	37	30.0	14	44.52	27	13.7	6	53.57	31	11.4	0	53.18	56	25.6	11
Sept. 6.8	2.80	39	28.6	9	44.79	29	13.1	3	53.88	31	11.4	1	53.74	58	24.5	9
16.8	3.19	41	27.7	3	45.08	30	12.8	0	54.19	32	11.3	2	54.32	60	23.6	5
26.8	3.60	42	27.4	3	45.38	30	12.8	3	54.51	33	11.1	3	54.92	61	23.1	2
Oct. 6.7	4.02	41	27.7	10	45.68	29	13.1	7	54.84	33	10.8	4	55.53	61	22.9	1
16.7	4.43	39	28.7	17	45.97	30	13.8	10	55.17	32	10.4	4	56.14	60	23.0	4
26.7	4.82	37	30.4	22	46.27	28	14.8	13	55.49	31	10.0	5	56.74	58	23.4	7
Nov. 5.6	5.19	33	32.6	26	46.55	27	16.1	15	55.80	30	9.5	6	57.32	54	24.1	10
15.6	5.52	28	35.2	31	46.82	25	17.6	17	56.10	28	8.9	5	57.86	50	25.1	13
25.6	5.80	23	38.3	34	47.07	22	19.3	19	56.38	25	8.4	5	58.36	44	26.4	16
Dec. 5.6	6.03	17	41.7	36	47.29	18	21.2	18	56.63	21	7.9	4	58.80	37	28.0	19
15.5	6.20	10	45.3	36	47.47	15	23.0	19	56.84	17	7.5	3	59.17	29	29.9	20
25.5	6.30	2	48.9	36	47.62	10	24.9	17	57.01	13	7.2	3	59.46	20	31.9	22
35.5	6.32		52.5		47.72		26.6		57.14		6.9		59.66		34.1	
Sec δ, Tan δ	1.648		−1.310		1.003		−0.082		1.066		+0.369		2.100		+1.846	
Mean Place	2ˢ.570		54″.29		42ˢ.826		29″.32		51ˢ.416		3″.07		50ˢ.129		29″.51	
D′ψ α, Dω α	−0.03		−0.01		0.00		0.00		+0.01		0.00		+0.05		+0.02	
Dψ δ, Dω δ	0.0		+1.0		0.0		+1.0		0.0		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ξ^2 Canis Majoris. Mag. 4.5				23 H. Camelop. Mag. 5.6				51 Aurigæ. Mag. 5.7				γ Geminorum. Mag. 1.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 31		−22 53		6 31		+79 39		6 32		+39 28		6 32		+16 28	
	s		″		s		″		s		″		s		″	
Jan. 0.5	28.78	6	37.1	26	43.47	22	44.4	30	44.20	12	10.9	10	46.37	10	31.6	4
10.5	28.84	1	39.7	24	43.69	3	47.4	29	44.32	6	11.9	11	46.47	5	31.2	3
20.4	28.85	4	42.1	21	43.66	28	50.3	28	44.38	0	13.0	10	46.52	0	30.9	2
30.4	28.81	9	44.2	19	43.38	50	53.1	25	44.38	7	14.0	10	46.52	5	30.7	1
Feb. 9.4	28.72	12	46.1	15	42.88	71	55.6	21	44.31	11	15.0	9	46.47	9	30.6	1
19.4	28.60	16	47.6	12	42.17	87	57.7	17	44.20	16	15.9	8	46.38	12	30.5	0
Mar. 1.3	28.44	18	48.8	8	41.30	99	59.4	12	44.04	19	16.7	6	46.26	15	30.5	0
11.3	28.26	20	49.6	4	40.31	106	60.6	7	43.85	21	17.3	3	46.11	17	30.5	1
21.3	28.06	20	50.0	1	39.25	108	61.3	0	43.64	21	17.6	1	45.94	17	30.6	1
31.2	27.86	19	50.1	3	38.17	106	61.3	5	43.43	21	17.7	1	45.77	16	30.7	1
Apr. 10.2	27.67	18	49.8	7	37.11	98	60.8	10	43.22	18	17.6	4	45.61	14	30.8	0
20.2	27.49	15	49.1	10	36.13	87	59.8	15	43.04	16	17.2	6	45.47	12	30.8	1
30.2	27.34	12	48.1	13	35.26	72	58.3	20	42.88	11	16.6	7	45.35	9	30.9	1
May 10.1	27.22	9	46.8	16	34.54	55	56.3	23	42.77	7	15.9	8	45.26	5	31.0	1
20.1	27.13	5	45.2	18	33.99	35	54.0	26	42.70	2	15.1	10	45.21	1	31.1	2
30.1	27.08	0	43.4	21	33.64	14	51.4	28	42.68	3	14.1	10	45.20	3	31.3	2
June 9.1	27.08	3	41.3	22	33.50	8	48.6	29	42.71	8	13.1	11	45.23	7	31.5	3
19.0	27.11	8	39.1	24	33.58	28	45.7	30	42.79	13	12.0	10	45.30	11	31.8	3
29.0	27.19	11	36.7	23	33.86	49	42.7	29	42.92	18	11.0	11	45.41	14	32.1	3
July 9.0	27.30	15	34.4	24	34.35	68	39.8	28	43.10	22	9.9	10	45.55	18	32.4	3
18.9	27.45	18	32.0	22	35.03	86	37.0	26	43.32	26	8.9	9	45.73	21	32.7	3
28.9	27.63	21	29.8	20	35.89	101	34.4	24	43.58	29	8.0	8	45.94	24	33.0	3
Aug. 7.9	27.84	24	27.8	18	36.90	116	32.0	21	43.87	32	7.2	8	46.18	26	33.3	3
17.9	28.08	26	26.0	15	38.06	128	29.9	18	44.19	34	6.4	7	46.44	28	33.6	1
27.8	28.34	28	24.5	11	39.34	137	28.1	14	44.53	36	5.7	6	46.72	29	33.7	0
Sept. 6.8	28.62	29	23.4	6	40.71	145	26.7	11	44.89	37	5.1	5	47.01	30	33.7	0
16.8	28.91	31	22.8	2	42.16	150	25.6	6	45.26	39	4.6	4	47.31	32	33.7	2
26.8	29.22	31	22.6	4	43.66	152	25.0	2	45.65	39	4.2	3	47.63	32	33.5	4
Oct. 6.7	29.53	30	23.0	8	45.18	151	24.8	2	46.04	39	3.9	3	47.95	32	33.1	5
16.7	29.83	31	23.8	13	46.69	148	25.0	7	46.43	39	3.6	1	48.27	32	32.6	6
26.7	30.14	29	25.1	17	48.17	141	25.7	11	46.82	38	3.5	1	48.59	30	32.0	7
Nov. 5.6	30.43	28	26.8	21	49.58	131	26.8	15	47.20	37	3.6	2	48.89	30	31.3	7
15.6	30.71	25	28.9	24	50.89	119	28.3	19	47.57	34	3.8	3	49.19	28	30.6	8
25.6	30.96	22	31.3	26	52.08	102	30.2	23	47.91	30	4.1	5	49.47	25	29.8	8
Dec. 5.6	31.18	18	33.9	28	53.10	82	32.5	26	48.21	26	4.6	6	49.72	21	29.0	7
15.5	31.36	14	36.7	27	53.92	61	35.1	28	48.47	21	5.2	8	49.93	18	28.3	6
25.5	31.50	9	39.4	27	54.53	38	37.9	29	48.68	16	6.0	10	50.11	13	27.7	5
35.5	31.59		42.1		54.91		40.8		48.84		7.0		50.24		27.2	
Sec δ, Tan δ	1.085		−0.422		5.572		+5.482		1.295		+0.823		1.043		+0.296	
Mean Place	27ˢ.139		43″.72		34ˢ.676		36″.15		42ˢ.055		3″.71		44ˢ.662		24″.80	
$D'_\psi\alpha$, $D_\omega\alpha$	−0.01		0.00		+0.14		+0.05		+0.02		+0.01		+0.01		0.00	
$D_\psi\delta$, $D_\omega\delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Argûs.				S Monocerotis.				ε Geminorum.				ξ Geminorum.		
	Mag. 3.2				Mag. 4.7				Mag. 3.2				Mag. 3.4		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decli tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	6 35		−43 6		6 36		+ 9 58		6 38		+25 13		6 40		+12
	s		″		s		″		s		″		s		″
Jan. 0.5	9.80		65.4		16.18		40.7		40.34		8.8		29.47		27.8
10.5	9.83	3	68.7	33	16.28	10	39.9	8	40.45	11	8.9	1	29.58	11	27.1
20.4	9.79	4	71.8	31	16.33	5	39.2	7	40.52	7	9.1	2	29.63	5	26.5
30.4	9.70	9	74.7	29	16.33	0	38.6	6	40.52	0	9.4	3	29.64	1	26.1
Feb. 9.4	9.56	14	77.2	25	16.29	4	38.1	5	40.48	4	9.7	3	29.59	5	25.8
19.4	9.37	19	79.2	20	16.20	9	37.8	3	40.39	9	10.0	3	29.51	8	25.6
Mar. 1.3	9.14	23	80.9	17	16.08	12	37.6	2	40.26	13	10.3	3	29.39	12	25.5
11.3	8.88	26	82.0	11	15.93	15	37.5	1	40.10	16	10.6	3	29.24	15	25.5
21.3	8.60	28	82.7	7	15.77	16	37.5	0	39.93	17	10.8	2	29.08	16	25.5
31.3	8.32	28	82.9	2	15.60	17	37.5	0	39.75	18	10.9	1	28.91	17	25.5
Apr. 10.2	8.05	27	82.6	3	15.44	16	37.6	1	39.58	17	10.9	0	28.75	16	25.6
20.2	7.79	26	81.8	8	15.30	14	37.8	2	39.43	15	10.9	0	28.61	14	25.8
30.2	7.56	23	80.6	12	15.18	12	38.1	3	39.30	13	10.8	1	28.49	12	26.0
May 10.1	7.37	19	79.0	16	15.09	9	38.4	3	39.20	10	10.6	2	28.40	9	26.2
20.1	7.21	16	76.9	21	15.04	5	38.8	4	39.14	6	10.3	3	28.34	6	26.5
30.1	7.10	11	74.6	23	15.02	2	39.3	5	39.12	2	10.1	2	28.32	2	26.8
June 9.1	7.04	6	71.9	27	15.04	2	39.9	6	39.15	3	9.8	3	28.34	2	27.2
19.0	7.03	1	69.1	28	15.11	7	40.5	6	39.22	7	9.6	2	28.40	6	27.6
29.0	7.07	4	66.1	30	15.21	10	41.1	6	39.33	11	9.3	3	28.50	10	28.1
July 9.0	7.16	9	63.1	30	15.35	14	41.8	7	39.48	15	9.1	2	28.64	14	28.6
19.0	7.29	13	60.1	30	15.52	17	42.5	7	39.67	19	8.9	2	28.81	17	29.0
28.9	7.47	18	57.3	28	15.72	20	43.2	7	39.89	22	8.7	2	29.01	20	29.5
Aug. 7.9	7.69	22	54.6	27	15.94	22	43.8	6	40.13	24	8.5	2	29.23	22	29.9
17.9	7.95	26	52.3	23	16.19	25	44.2	4	40.40	27	8.3	2	29.48	25	30.3
27.8	8.24	29	50.4	19	16.45	26	44.6	4	40.69	29	8.1	2	29.75	27	30.5
Sept. 6.8	8.56	32	48.9	15	16.74	29	44.8	2	41.00	31	7.9	2	30.03	28	30.6
16.8	8.90	34	48.0	9	17.03	29	44.8	0	41.32	32	7.6	3	30.33	30	30.5
26.8	9.25	35	47.6	4	17.33	30	44.7	1	41.65	33	7.2	4	30.63	30	30.3
Oct. 6.7	9.61	36	47.9	3	17.64	31	44.3	4	41.99	34	6.8	4	30.94	31	29.9
16.7	9.97	36	48.8	9	17.95	31	43.7	6	42.33	34	6.4	4	31.26	32	29.3
26.7	10.33	36	50.2	14	18.26	31	43.0	7	42.67	34	5.9	5	31.57	31	28.6
Nov. 5.7	10.66	33	52.2	20	18.56	30	42.1	9	43.01	34	5.5	4	31.88	31	27.8
15.6	10.97	31	54.7	25	18.85	29	41.1	10	43.33	32	5.0	5	32.17	29	26.9
25.6	11.25	28	57.6	29	19.12	27	40.0	11	43.62	29	4.6	4	32.45	28	25.9
Dec. 5.6	11.48	23	60.8	32	19.36	24	38.9	11	43.89	27	4.3	3	32.70	25	24.9
15.5	11.66	18	64.2	34	19.57	21	37.8	11	44.13	24	4.1	2	32.92	22	24.0
25.5	11.79	13	67.7	35	19.74	17	36.7	11	44.32	19	4.0	1	33.10	18	23.1
35.5	11.86	7	71.1	34	19.87	13	35.8	9	44.47	15	4.0	0	33.23	13	22.3
Sec δ, Tan δ	1.370		−0.936		1.015		+0.176		1.105		+0.471		1.026		+0.231
Mean Place	$7^{s}.872$		$72''.32$		$14^{s}.531$		$34''.03$		$38^{s}.511$		$2''.12$		$27^{s}.791$		$21''.19$
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.02		−0.01		0.00		0.00		+0.01		+0.01		+0.01		0.00
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ψ^5 Aurigæ. Mag. 5.3				α Canis Majoris. Mag. −1.6				18 Monocerotis. Mag. 4.7				43 Camelop. Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 40		+43 39		6 41		−16 35		6 43		+ 2 30		6 44		+68 59	
	s		″		s		″		s		″		s		″	
Jan. 0.5	34.94		57.6		22.96		44.6		24.18		32.1		30.96		30.6	
10.5	35.07	13	58.8	12	23.03	7	47.0	24	24.28	10	30.8	13	31.15	19	33.1	25
20.4	35.14	7	60.1	13	23.06	3	49,2	22	24.33	5	29.6	12	31.22	7	35.7	26
30.4	35.14	0	61.4	13	23.03	3	51.1	19	24.34	1	28.6	10	31.16	6	38.2	25
Feb. 9.4	35.08	6	62.6	12	22.96	7	52.8	17	24.29	5	27.8	8	30.98	18	40.5	23
19.4	34.96	12	63.7	11	22.85	11	54.2	14	24.21	8	27.2	6	30.69	29	42.5	20
Mar. 1.3	34.80	16	64.7	10	22.71	14	55.3	11	24.09	12	26.7	5	30.31	38	44.1	16
11.3	34.60	20	65.4	7	22.54	17	56.0	7	23.94	15	26.4	3	29.86	45	45.3	12
21.3	34.38	22	65.9	5	22.36	18	56.4	4	23.78	16	26.3	1	29.36	50	46.1	8
31.3	34.15	23	66.0	1	22.17	19	56.5	1	23.62	16	26.3	0	28.85	51	46.3	2
Apr. 10.2	33.93	22	65.9	1	21.99	18	56.3	2	23.46	16	26.4	1	28.35	50	46.1	2
20.2	33.72	21	65.6	3	21.82	17	55.8	5	23.31	15	26.7	3	27.88	47	45.4	7
30.2	33.55	17	65.0	6	21.68	14	55.0	8	23.19	12	27.1	4	27.46	42	44.2	12
May 10.1	33.42	13	64.2	8	21.57	11	53.9	11	23.09	10	27.7	6	27.12	34	42.6	16
20.1	33.33	9	63.2	10	21.49	8	52.5	14	23.03	6	28.4	7	26.87	25	40.7	19
30.1	33.30	3	62.0	12	21.45	4	50.9	16	23.00	3	29.2	8	26.71	16	38.6	21
June 9.1	33.32	2	60.8	12	21.45	0	49.2	17	23.02	2	30.1	9	26.66	5	36.2	24
19.0	33.39	7	59.5	13	21.48	3	47.3	19	23.07	5	31.1	10	26.72	6	33.7	25
29.0	33.52	13	58.2	13	21.56	8	45.3	20	23.16	9	32.2	11	26.88	16	31.2	25
July 9.0	33.69	17	56.9	13	21.67	11	43.3	20	23.28	12	33.3	11	27.14	26	28.6	26
19.0	33.91	22	55.7	12	21.82	15	41.3	20	23.44	16	34.3	10	27.50	36	26.1	25
28.9	34.17	26	54.5	12	21.99	17	39.4	19	23.63	19	35.4	11	27.94	44	23.8	23
Aug. 7.9	34.47	30	53.4	11	22.20	21	37.7	17	23.84	21	36.3	9	28.46	52	21.6	22
17.9	34.80	33	52.4	10	22.43	23	36.2	15	24.07	23	37.1	8	29.06	60	19.6	20
27.8	35.16	36	51.5	9	22.69	26	35.0	12	24.33	26	37.7	6	29.72	66	17.9	17
Sept. 6.8	35.54	38	50.7	8	22.96	27	34.1	9	24.60	27	38.1	4	30.42	70	16.5	14
16.8	35.93	39	50.0	7	23.24	28	33.6	5	24.88	28	38.3	2	31.16	74	15.3	12
26.8	36.34	41	49.5	5	23.54	30	33.5	1	25.18	30	38.2	1	31.93	77	14.5	8
Oct. 6.7	36.76	42	49.1	4	23.84	30	33.9	4	25.48	30	37.8	4	32.72	79	14.1	4
16.7	37.18	42	48.8	3	24.14	30	34.8	9	25.78	30	37.2	6	33.51	79	14.0	1
26.7	37.59	41	48.7	1	24.44	30	36.0	12	26.09	31	36.2	10	34.29	78	14.4	4
Nov. 5.7	38.00	41	48.8	1	24.73	29	37.7	17	26.38	29	35.1	11	35.05	76	15.1	7
15.6	38.39	39	49.1	3	25.00	27	39.7	20	26.67	29	33.8	13	35.77	72	16.1	10
25.6	38.75	36	49.5	4	25.26	26	41.9	22	26.93	26	32.3	15	36.43	66	17.6	15
Dec. 5.6	39.08	33	50.2	7	25.48	22	44.4	25	27.17	24	30.8	15	37.02	59	19.4	18
15.5	39.36	28	51.0	8	25.67	19	46.9	25	27.38	21	29.3	15	37.51	49	21.4	20
25.5	39.59	23	52.1	11	25.82	15	49.4	25	27.56	18	27.8	15	37.90	39	23.7	23
35.5	39.77	18	53.2	11	25.92	10	51.9	25	27.68	12	26.4	14	38.18	28	26.2	25
Sec δ, Tan δ	1.382		+0.954		1.044		−0.298		1.001		+0.044		2.789		+2.604	
Mean Place	32ˢ.631		50″.83		21ˢ.503		50″.96		22ˢ.579		25″.59		26ˢ.385		23″.81	
$D'_\psi a$, $D_\omega a$	+0.02		+0.01		−0.01		0.00		0.00		0.00		+0.07		+0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Geminorum. Mag. 3.6				ζ Mensæ. Mag. 5.6				α Pictoris. Mag. 3.3				τ Argûs. Mag. 2.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 6 47		° ′ +34 3		h m 6 47		° ′ −80 43		h m 6 47		° ′ −61 50		h m 6 47		° ′ −50 30	
	s		″		s		″		s		″		s		″	
Jan. 0.5	9.39		63.7		20.74		17.5		21.34		48.2		50.23		35.8	
10.5	9.52	13	64.3	6	20.43	31	21.1	36	21.32	2	51.9	37	50.26	3	39.3	35
20.5	9.59	7	65.1	8	19.87	56	24.5	34	21.22	10	55.4	35	50.22	4	42.7	34
30.4	9.61	2	65.8	7	19.07	80	27.7	32	21.02	20	58.6	32	50.11	11	45.8	31
Feb. 9.4	9.57	4	66.6	8	18.06	101	30.6	29	20.75	27	61.5	29	49.94	17	48.5	27
19.4	9.48	9	67.4	8	16.86	120	33.1	25	20.41	34	64.0	25	49.71	23	50.9	24
Mar. 1.3	9.34	14	68.0	6	15.52	134	35.1	20	20.01	40	66.0	20	49.44	27	52.8	19
11.3	9.17	17	68.5	5	14.08	144	36.7	16	19.57	44	67.5	15	49.14	30	54.2	14
21.3	8.98	19	68.9	4	12.56	152	37.8	11	19.10	47	68.5	10	48.82	32	55.1	9
31.3	8.79	19	69.1	2	11.01	155	38.3	5	18.62	48	68.9	4	48.48	34	55.5	4
Apr. 10.2	8.60	19	69.1	0	9.47	154	38.3	0	18.14	48	68.8	1	48.15	33	55.4	1
20.2	8.43	17	68.9	2	7.97	150	37.8	5	17.69	45	68.2	6	47.84	31	54.8	6
30.2	8.28	15	68.6	3	6.55	142	36.8	10	17.26	43	67.1	11	47.55	29	53.7	11
May 10.2	8.17	11	68.1	5	5.24	131	35.3	15	16.88	38	65.5	16	47.30	25	52.1	16
20.1	8.09	8	67.6	5	4.07	117	33.4	19	16.56	32	63.4	21	47.09	21	50.1	20
30.1	8.06	3	66.9	7	3.06	101	31.1	23	16.29	27	61.0	24	46.93	16	47.8	23
June 9.1	8.08	2	66.2	7	2.24	82	28.5	26	16.10	19	58.3	27	46.82	11	45.2	26
19.0	8.14	6	65.4	8	1.62	62	25.6	29	15.97	13	55.3	30	46.77	5	42.3	29
29.0	8.25	11	64.6	8	1.23	39	22.5	31	15.93	4	52.1	32	46.77	0	39.2	31
July 9.0	8.41	16	63.9	7	1.07	16	19.3	32	15.96	3	48.8	33	46.83	6	36.0	32
19.0	8.60	19	63.1	8	1.14	7	16.1	32	16.07	11	45.5	33	46.95	12	32.9	31
28.9	8.82	22	62.4	7	1.44	30	13.0	31	16.25	18	42.4	31	47.12	17	29.9	30
Aug. 7.9	9.08	26	61.7	7	1.97	53	10.1	29	16.50	25	39.4	30	47.34	22	27.1	28
17.9	9.37	29	61.1	6	2.71	74	7.4	27	16.82	32	36.7	27	47.60	26	24.6	25
27.9	9.68	31	60.4	7	3.63	92	5.2	22	17.19	37	34.5	22	47.91	31	22.5	21
Sept. 6.8	10.01	33	59.8	6	4.72	109	3.4	18	17.62	43	32.7	18	48.25	34	20.8	17
16.8	10.36	35	59.3	5	5.93	121	2.1	13	18.08	46	31.5	12	48.61	36	19.7	11
26.8	10.71	35	58.8	5	7.23	130	1.4	7	18.57	49	30.9	6	49.00	39	19.2	5
Oct. 6.7	11.08	37	58.3	5	8.57	134	1.4	0	19.08	51	30.9	0	49.40	40	19.3	1
16.7	11.45	37	57.8	5	9.91	134	2.0	6	19.59	51	31.6	7	49.80	40	20.0	7
26.7	11.82	37	57.4	4	11.20	129	3.3	13	20.09	50	33.0	14	50.20	40	21.4	14
Nov. 5.7	12.19	37	57.2	2	12.38	118	5.1	18	20.56	47	35.0	20	50.58	38	23.4	20
15.6	12.54	35	57.0	2	13.42	104	7.5	24	20.99	43	37.5	25	50.92	34	25.9	25
25.6	12.87	33	57.0	0	14.27	85	10.4	29	21.36	37	40.5	30	51.23	31	28.8	29
Dec. 5.6	13.17	30	57.1	1	14.91	64	13.6	32	21.66	30	43.9	34	51.50	27	32.1	33
15.6	13.43	26	57.3	2	15.30	39	17.1	35	21.88	22	47.5	36	51.70	20	35.6	35
25.5	13.64	21	57.7	4	15.42	12	20.7	36	22.01	13	51.2	37	51.84	14	39.2	36
35.5	13.81	17	58.3	6	15.28	14	24.4	37	22.06	5	54.9	37	51.91	7	42.9	37
Sec δ, Tan δ	1.207		+0.676		6.202		−6.121		2.119		−1.868		1.572		−1.214	
Mean Place	7ˢ.371		57″.47		13ˢ.373		26″.13		18ˢ.623		56″.29		48ˢ.120		43″.54	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.02		+0.01		−0.16		−0.08		−0.05		−0.03		−0.03		−0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**15 Lyncis.** Mag. 4.5				**θ Canis Majoris.** Mag. 4.2				**ε Canis Majoris.** Mag. 1.6				**ζ Geminorum.** Var. 3.7–4.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		°	
	6 49		+58 32		6 50		−11 55		6 55		−28 50		6 59		+20 41	
	s		″		s		″		s		″		s		″	
Jan. 0.5	53.38		18.7		13.26		41.4		16.40		68.4		2.34		56.1	
10.5	53.56	18	20.7	20	13.35	9	43.5	21	16.48	8	71.3	29	2.47	13	55.9	2
20.5	53.64	8	22.8	21	13.40	5	45.5	20	16.50	2	74.1	28	2.55	8	55.8	1
30.4	53.63	1	24.8	20	13.39	1	47.3	18	16.48	2	76.6	25	2.57	2	55.8	0
Feb. 9.4	53.54	9	26.7	19	13.34	5	48.8	15	16.40	8	78.8	22	2.55	2	55.9	1
19.4	53.37	17	28.4	17	13.25	9	50.1	13	16.28	12	80.7	19	2.48	7	56.1	2
Mar. 1.3	53.13	24	29.9	15	13.12	13	51.1	10	16.12	16	82.3	16	2.37	11	56.3	2
11.3	52.84	29	31.0	11	12.97	15	51.8	7	15.93	19	83.4	11	2.23	14	56.5	2
21.3	52.52	32	31.7	7	12.80	17	52.2	4	15.73	20	84.1	7	2.07	16	56.7	2
31.3	52.19	33	32.0	3	12.62	18	52.3	1	15.52	21	84.4	3	1.90	17	56.8	1
Apr. 10.2	51.86	33	31.9	1	12.44	18	52.1	2	15.31	21	84.3	1	1.73	17	56.9	1
20.2	51.55	31	31.4	5	12.28	16	51.7	4	15.11	20	83.8	5	1.57	16	57.0	1
30.2	51.28	27	30.5	9	12.14	14	51.0	7	14.93	18	82.9	9	1.44	13	57.1	1
May 10.2	51.07	21	29.3	12	12.03	11	50.0	10	14.78	15	81.6	13	1.34	10	57.1	0
20.1	50.91	16	27.8	15	11.95	8	48.9	11	14.66	12	80.1	15	1.27	7	57.1	0
30.1	50.82	9	26.0	18	11.91	4	47.5	14	14.58	8	78.2	19	1.23	4	57.0	1
June 9.1	50.81	1	24.1	19	11.90	1	46.0	15	14.54	4	76.1	21	1.24	1	57.0	0
19.0	50.87	6	22.0	21	11.93	3	44.3	17	14.55	1	73.8	23	1.29	5	57.0	0
29.0	51.00	13	19.9	21	12.00	7	42.5	18	14.59	4	71.3	25	1.38	9	57.0	0
July 9.0	51.19	19	17.8	21	12.11	11	40.7	18	14.67	8	68.8	25	1.50	12	57.0	0
19.0	51.45	26	15.8	20	12.25	14	38.9	18	14.79	12	66.3	25	1.66	16	56.9	1
28.9	51.78	33	13.8	20	12.42	17	37.1	18	14.95	16	63.8	25	1.85	19	56.9	0
Aug. 7.9	52.15	37	12.0	18	12.61	19	35.5	16	15.15	20	61.6	22	2.07	22	56.8	1
17.9	52.58	43	10.3	17	12.84	23	34.1	14	15.37	22	59.5	21	2.32	25	56.7	1
27.9	53.04	46	8.8	15	13.08	24	33.0	11	15.62	25	57.8	17	2.59	27	56.6	1
Sept. 6.8	53.53	49	7.5	13	13.34	26	32.2	8	15.89	27	56.5	13	2.88	29	56.3	3
16.8	54.06	53	6.4	11	13.62	28	31.7	5	16.18	29	55.7	8	3.18	30	56.0	3
26.8	54.60	54	5.6	8	13.91	29	31.6	1	16.49	31	55.4	3	3.49	31	55.5	5
Oct. 6.7	55.16	56	5.1	5	14.21	30	31.9	3	16.81	32	55.6	2	3.82	33	55.0	5
16.7	55.72	56	4.8	3	14.51	30	32.6	7	17.13	32	56.3	7	4.15	33	54.3	7
26.7	56.28	56	4.9	1	14.81	30	33.8	12	17.45	32	57.6	13	4.48	33	53.6	7
Nov. 5.7	56.82	54	5.2	3	15.11	30	35.3	15	17.76	31	59.3	17	4.81	33	52.9	7
15.6	57.34	52	5.9	7	15.39	28	37.0	17	18.06	30	61.5	22	5.13	32	52.1	8
25.6	57.83	49	6.9	10	15.66	27	39.1	21	18.33	27	64.0	25	5.43	30	51.4	7
Dec. 5.6	58.27	44	8.2	13	15.90	24	41.3	22	18.58	25	66.8	28	5.71	28	50.7	7
15.6	58.65	38	9.7	15	16.10	20	43.6	23	18.78	20	69.7	29	5.95	24	50.2	5
25.5	58.96	31	11.5	18	16.27	17	45.9	23	18.94	16	72.8	31	6.16	21	49.7	5
35.5	59.18	22	13.5	20	16.39	12	48.1	22	19.05	11	75.8	30	6.32	16	49.4	3
Sec δ, Tan δ	1.916		+1.634		1.022		−0.211		1.142		−0.551		1.069		+0.378	
Mean Place	50ˢ.183		12″.54		11ˢ.684		48″.14		14ˢ.745		75″.73		0ˢ.566		50″.41	
$D'_{\psi}a$, $D_{\omega}a$	+0.04		+0.02		−0.01		0.00		−0.01		−0.01		+0.01		+0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	o^2 Canis Majoris. Mag. 3.1				γ Canis Majoris. Mag. 4.1				δ Canis Majoris. Mag. 2.0				63 Aurigæ. Mag. 5.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	6 59		−23 42		6 59		−15 30		7 4		−26 15		7 5		+39 27	
	s		″		s		″		s		″		s		″	
Jan. 0.5	27.61		17.6		53.65		12.8		55.23		14.1		46.79		47.6	
10.5	27.70	9	20.4	28	53.75	10	15.1	23	55.32	9	17.0	29	46.95	16	48.5	9
20.5	27.74	4	22.9	25	53.79	4	17.3	22	55.36	4	19.7	27	47.05	10	49.6	11
30.4	27.73	1	25.3	24	53.79	0	19.3	20	55.35	1	22.1	24	47.08	3	50.7	11
Feb. 9.4	27.66	7	27.4	21	53.75	4	21.1	18	55.29	6	24.3	22	47.05	3	51.8	11
19.4	27.56	10	29.1	17	53.66	9	22.5	14	55.18	11	26.2	19	46.97	8	52.8	10
Mar. 1.4	27.42	14	30.5	14	53.53	13	23.7	12	55.04	14	27.7	15	46.84	13	53.8	10
11.3	27.24	18	31.6	11	53.37	16	24.5	8	54.86	18	28.9	12	46.67	17	54.5	7
21.3	27.05	19	32.2	6	53.20	17	25.0	5	54.67	19	29.6	7	46.47	20	55.1	6
31.3	26.86	19	32.5	3	53.02	18	25.2	2	54.47	20	30.0	4	46.26	21	55.5	4
Apr. 10.2	26.66	20	32.4	1	52.84	18	25.1	1	54.27	20	30.0	0	46.05	21	55.6	1
20.2	26.48	18	32.0	4	52.67	17	24.7	4	54.08	19	29.6	4	45.86	19	55.5	1
30.2	26.32	16	31.2	8	52.53	14	24.0	7	53.90	18	28.8	8	45.69	17	55.2	3
May 10.2	26.18	14	30.1	11	52.41	12	23.0	10	53.76	14	27.7	11	45.55	14	54.6	6
20.1	26.07	11	28.6	15	52.32	9	21.8	12	53.64	12	26.2	15	45.46	9	53.9	7
30.1	26.00	7	26.9	17	52.26	6	20.4	14	53.56	8	24.5	17	45.40	6	53.0	9
June 9.1	25.97	3	25.0	19	52.24	2	18.7	17	53.52	4	22.5	20	45.40	0	52.1	9
19.1	25.98	1	22.8	22	52.26	2	16.9	18	53.52	0	20.3	22	45.44	4	51.0	11
29.0	26.02	4	20.6	22	52.32	6	15.0	19	53.55	3	18.0	23	45.53	9	49.9	11
July 9.0	26.11	9	18.3	23	52.41	9	13.1	19	53.63	8	15.6	24	45.67	14	48.8	11
19.0	26.23	12	16.0	23	52.54	13	11.1	20	53.74	11	13.2	24	45.85	18	47.7	11
28.9	26.39	16	13.7	23	52.70	16	9.2	19	53.89	15	10.8	24	46.07	22	46.5	12
Aug. 7.9	26.58	19	11.6	21	52.89	19	7.5	17	54.08	19	8.7	21	46.33	26	45.5	10
17.9	26.79	21	9.8	18	53.10	21	6.0	15	54.29	21	6.7	20	46.61	28	44.4	11
27.9	27.03	24	8.3	15	53.34	24	4.7	13	54.53	24	5.1	16	46.93	32	43.4	10
Sept. 6.8	27.30	27	7.1	12	53.60	26	3.7	10	54.79	26	3.8	13	47.27	34	42.5	9
16.8	27.58	28	6.3	8	53.87	27	3.2	5	55.08	29	3.0	8	47.63	36	41.6	9
26.8	27.88	30	6.0	3	54.16	29	3.0	2	55.38	30	2.6	4	48.00	37	40.8	8
Oct. 6.8	28.19	31	6.3	3	54.46	30	3.3	3	55.69	31	2.8	2	48.39	39	40.1	7
16.7	28.50	31	7.0	7	54.77	31	4.0	7	56.01	32	3.5	7	48.78	39	39.5	6
26.7	28.81	31	8.2	12	55.08	31	5.2	12	56.33	32	4.7	12	49.18	40	39.0	5
Nov. 5.7	29.12	31	9.8	16	55.38	30	6.7	15	56.64	31	6.4	17	49.58	40	38.7	3
15.6	29.41	29	11.9	21	55.67	29	8.6	19	56.94	30	8.5	21	49.96	38	38.5	2
25.6	29.69	28	14.3	24	55.94	27	10.7	21	57.22	28	10.9	24	50.32	36	38.6	1
Dec. 5.6	29.93	24	16.9	26	56.18	24	13.1	24	57.47	25	13.6	27	50.66	34	38.8	2
15.6	30.14	21	19.7	28	56.39	21	15.5	24	57.68	21	16.5	29	50.96	30	39.2	4
25.5	30.31	17	22.6	29	56.57	18	18.0	25	57.85	17	19.4	29	51.21	25	39.9	7
35.5	30.43	12	25.4	28	56.70	13	20.5	25	57.98	13	22.4	30	51.40	19	40.7	8
Sec δ, Tan δ	1.092		−0.439		1.038		−0.277		1.115		−0.493		1.295		+0.823	
Mean Place	$26^{s}.006$		$24''.87$		$52^{s}.075$		$19''.71$		$53^{s}.617$		$21''.57$		$44^{s}.592$		$42''.74$	
$D'_{\psi}a$, $D_{\omega}a$	−0.01		−0.01		−0.01		0.00		−0.01		−0.01		+0.02		+0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**51 Geminorum.** Mag. 5.3				**γ^2 Volantis.** Mag. 3.9				**25 H. Camelop.** Mag. 5.1				**λ Geminorum.** Mag. 3.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 7 8		° ′ +16 18		h m 7 9		° ′ −70 21		h m 7 13		° ′ +82 34		h m 7 13		° ′ +16 41	
	s		″		s		″		s		″		s		″	
Jan. 0.5	27.79		26.3		32.28		24.1		16.56		53.3		10.84		52.0	
10.5	27.93	14	25.7	6	32.27	1	27.9	38	17.12	56	56.3	30	10.98	14	51.5	5
20.5	28.01	8	25.3	4	32.13	14	31.5	36	17.34	22	59.3	30	11.07	9	51.1	4
30.4	28.04	3	25.0	3	31.87	26	35.0	35	17.22	12	62.3	30	11.11	4	50.9	2
Feb. 9.4	28.03	1	24.9	1	31.50	37	38.2	32	16.76	46	65.1	28	11.10	1	50.7	2
19.4	27.97	6	24.9	0	31.03	47	41.0	28	15.98	78	67.7	26	11.04	6	50.7	0
Mar. 1.4	27.86	11	24.9	0	30.47	56	43.3	23	14.94	104	69.9	22	10.94	10	50.8	1
11.3	27.73	13	25.0	1	29.85	62	45.2	19	13.68	126	71.6	17	10.81	13	50.9	1
21.3	27.57	16	25.1	1	29.18	67	46.6	14	12.27	141	72.8	12	10.65	16	51.1	2
31.3	27.41	16	25.3	2	28.49	69	47.4	8	10.77	150	73.4	6	10.49	16	51.2	1
Apr. 10.3	27.25	16	25.4	1	27.80	69	47.7	3	9.25	152	73.4	0	10.33	16	51.4	2
20.2	27.09	16	25.6	2	27.12	68	47.5	2	7.78	147	72.9	5	10.17	16	51.6	2
30.2	26.96	13	25.8	2	26.47	65	46.8	7	6.41	137	71.8	11	10.04	13	51.7	1
May 10.2	26.85	11	25.9	1	25.87	60	45.5	13	5.19	122	70.2	16	9.93	11	51.8	1
20.1	26.78	7	26.1	2	25.33	54	43.8	17	4.18	101	68.2	20	9.85	8	52.0	2
30.1	26.74	4	26.2	1	24.87	46	41.7	21	3.40	78	65.8	24	9.81	4	52.2	2
June 9.1	26.74	0	26.4	2	24.50	37	39.2	25	2.89	51	63.1	27	9.81	0	52.3	1
19.1	26.78	4	26.6	2	24.22	28	36.3	29	2.66	23	60.2	29	9.84	3	52.5	2
29.0	26.86	8	26.8	2	24.05	17	33.3	30	2.71	5	57.1	31	9.91	7	52.7	2
July 9.0	26.97	11	27.0	2	23.98	7	30.1	32	3.05	34	54.0	31	10.02	11	52.9	2
19.0	27.12	15	27.2	2	24.02	4	26.8	33	3.66	61	50.9	31	10.16	14	53.0	1
28.9	27.29	17	27.4	2	24.17	15	23.6	32	4.53	87	47.9	30	10.34	18	53.1	1
Aug. 7.9	27.50	21	27.5	1	24.42	25	20.6	30	5.65	112	45.1	28	10.54	20	53.2	1
17.9	27.73	23	27.6	1	24.77	35	17.8	28	7.00	135	42.4	27	10.77	23	53.2	0
27.9	27.98	25	27.5	1	25.22	45	15.3	25	8.54	154	40.0	24	11.02	25	53.1	1
Sept. 6.8	28.26	28	27.4	1	25.75	53	13.3	20	10.25	171	38.0	20	11.29	27	52.9	2
16.8	28.55	29	27.1	3	26.34	59	11.8	15	12.11	186	36.3	17	11.58	29	52.6	3
26.8	28.85	30	26.7	4	26.98	64	10.9	9	14.07	196	35.0	13	11.88	30	52.2	4
Oct. 6.8	29.17	32	26.1	6	27.66	68	10.6	3	16.11	204	34.1	9	12.19	31	51.6	6
16.7	29.49	32	25.4	7	28.35	69	11.0	4	18.19	208	33.7	4	12.52	33	50.8	8
26.7	29.81	32	24.6	8	29.03	68	12.1	11	20.26	207	33.7	0	12.84	32	50.0	8
Nov. 5.7	30.13	32	23.7	9	29.68	65	13.8	17	22.28	202	34.2	5	13.17	33	49.0	10
15.6	30.45	32	22.7	10	30.27	59	16.1	23	24.21	193	35.2	10	13.48	31	48.1	9
25.6	30.75	30	21.7	10	30.79	52	18.9	28	26.00	179	36.7	15	13.79	31	47.1	10
Dec. 5.6	31.03	28	20.8	9	31.22	43	22.1	32	27.59	159	38.6	19	14.07	28	46.1	10
15.6	31.27	24	19.9	9	31.54	32	25.6	35	28.95	136	40.9	23	14.32	25	45.2	9
25.5	31.48	21	19.1	8	31.73	19	29.3	37	30.04	109	43.5	26	14.54	22	44.4	8
35.5	31.65	17	18.5	6	31.80	7	33.1	38	30.81	77	46.4	29	14.71	17	43.8	6
Sec δ, Tan δ	1.042		+0.293		2.975		−2.802		7.745		+7.680		1.044		+0.300	
Mean Place	26ˢ.073		20″.82		28ˢ.784		33″.98		3ˢ.826		49″.19		9ˢ.121		46″.83	
D′ψ α, Dω α	+0.01		+0.01		−0.07		−0.06		+0.19		+0.16		+0.01		+0.01	
Dψ δ, Dω δ	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**π Argûs.** Mag. 2.7				**δ Geminorum.** Mag. 3.5				**δ Volantis.** Mag. 4.0				**ι Geminorum.** Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 7 14		° ′ −36 56		h m 7 14		° ′ +22 8		h m 7 16		° ′ −67 47		h m 7 20		° ′ +27 58	
	s		″		s		″		s		″		s		″	
Jan. 0.5	8.03		25.5		61.12		34.6		56.11		49.3		25.15		16.1	
10.5	8.12	9	28.8	33	61.27	15	34.4	2	56.14	3	53.1	38	25.31	16	16.2	1
20.5	8.16	4	31.9	31	61.37	10	34.4	0	56.05	9	56.8	37	25.42	11	16.5	3
30.4	8.13	3	34.8	29	61.41	4	34.4	0	55.85	20	60.3	35	25.47	5	16.9	4
Feb. 9.4	8.05	8	37.5	27	61.40	1	34.6	2	55.54	31	63.6	33	25.46	1	17.4	5
19.4	7.92	13	39.8	23	61.34	6	34.8	2	55.15	39	66.4	28	25.40	6	18.0	6
Mar. 1.4	7.75	17	41.7	19	61.24	10	35.1	3	54.67	48	68.9	25	25.30	10	18.5	5
11.3	7.55	20	43.2	15	61.10	14	35.4	3	54.14	53	70.8	19	25.16	14	19.0	5
21.3	7.32	23	44.2	10	60.95	15	35.7	3	53.57	57	72.3	15	25.00	16	19.5	5
31.3	7.08	24	44.8	6	60.78	17	36.0	3	52.97	60	73.3	10	24.82	18	19.8	3
Apr. 10.3	6.84	24	44.9	1	60.61	17	36.2	2	52.36	61	73.7	4	24.65	17	20.0	2
20.2	6.61	23	44.6	3	60.45	16	36.3	1	51.77	59	73.5	2	24.48	17	20.1	1
30.2	6.40	21	43.8	8	60.31	14	36.4	1	51.20	57	72.9	6	24.33	15	20.1	0
May 10.2	6.22	18	42.6	12	60.20	11	36.4	0	50.67	53	71.7	12	24.21	12	20.0	1
20.1	6.06	16	41.1	15	60.12	8	36.3	1	50.20	47	70.1	16	24.12	9	19.7	3
30.1	5.94	12	39.2	19	60.07	5	36.3	0	49.79	41	68.0	21	24.06	6	19.4	3
June 9.1	5.86	8	37.0	22	60.07	0	36.2	1	49.46	33	65.6	24	24.05	1	19.0	4
19.1	5.83	3	34.5	25	60.10	3	36.0	2	49.21	25	62.8	28	24.08	3	18.6	4
29.0	5.84	1	31.9	26	60.18	8	35.9	1	49.06	15	59.8	30	24.15	7	18.1	5
July 9.0	5.89	5	29.2	27	60.29	11	35.8	1	48.99	7	56.7	31	24.26	11	17.6	5
19.0	5.99	10	26.4	28	60.43	14	35.6	2	49.02	3	53.4	33	24.41	15	17.1	5
29.0	6.12	13	23.7	27	60.61	18	35.4	2	49.15	13	50.2	32	24.59	18	16.5	6
Aug. 7.9	6.30	18	21.2	25	60.82	21	35.2	2	49.38	23	47.2	30	24.80	21	15.9	6
17.9	6.51	21	18.9	23	61.05	23	34.9	3	49.69	31	44.3	29	25.04	24	15.3	6
27.9	6.76	25	16.9	20	61.31	26	34.6	3	50.08	39	41.8	25	25.31	27	14.7	6
Sept. 6.8	7.03	27	15.3	16	61.59	28	34.1	5	50.54	46	39.7	21	25.60	29	14.0	7
16.8	7.33	30	14.2	11	61.89	30	33.6	5	51.07	53	38.2	15	25.91	31	13.3	7
26.8	7.65	32	13.7	5	62.20	31	33.1	5	51.65	58	37.2	10	26.23	32	12.6	7
Oct. 6.8	7.98	33	13.7	0	62.53	33	32.4	7	52.26	61	36.9	3	26.57	34	11.8	8
16.7	8.33	35	14.2	5	62.86	33	31.7	7	52.88	62	37.2	3	26.92	35	11.0	8
26.7	8.67	34	15.4	12	63.20	34	30.9	8	53.50	62	38.2	10	27.27	35	10.3	7
Nov. 5.7	9.01	34	17.1	17	63.54	34	30.0	9	54.10	60	39.8	16	27.63	36	9.5	8
15.7	9.33	32	19.3	22	63.87	33	29.2	8	54.65	55	42.0	22	27.97	34	8.8	7
25.6	9.63	30	21.9	26	64.18	31	28.5	7	55.14	49	44.8	28	28.31	34	8.2	6
Dec. 5.6	9.90	27	24.9	30	64.47	29	27.8	7	55.55	41	48.0	32	28.62	31	7.8	4
15.6	10.13	23	28.1	32	64.74	27	27.2	6	55.86	31	51.5	35	28.89	27	7.5	3
25.5	10.31	18	31.4	33	64.96	22	26.7	5	56.07	21	55.3	38	29.13	24	7.3	2
35.5	10.44	13	34.8	34	65.14	18	26.4	3	56.17	10	59.1	38	29.32	19	7.4	1
Sec δ, Tan δ	1.251		−0.752		1.080		+0.407		2.646		−2.450		1.132		+0.531	
Mean Place	$6^{s}.324$		33″.80		$59^{s}.326$		29″.74		$53^{s}.017$		59″.52		$23^{s}.247$		11″.75	
$D'_{\psi}\,\alpha$, $D_{\omega}\,\alpha$	−0.02		−0.02		+0.01		+0.01		−0.06		−0.05		+0.01		+0.01	
$D_{\psi}\,\delta$, $D_{\omega}\,\delta$	−0.1		+0.9		−0.1		+0.9		−0.1		+0.9		−0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Canis Majoris. Mag. 2.4				Groombridge 1308. Mag. 5.8				β Canis Minoris. Mag. 3.1				ρ Geminorum. Mag. 4.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 20		−29 7		7 21		+68 38		7 22		+ 8 27		7 23		+31 57	
	s		″		s		″		s		″		s		″	
n. 0.5	43.25		56.8		61.34		37.2		30.91		53.6		36.92		27.8	
10.5	43.36	11	59.9	31	61.62	28	39.6	24	31.05	14	52.5	11	37.09	17	28.2	4
20.5	43.41	5	62.8	29	61.79	17	42.1	25	31.14	9	51.6	9	37.20	11	28.7	5
30.4	43.41	0	65.5	27	61.82	3	44.7	26	31.19	5	50.8	8	37.25	5	29.4	7
eb. 9.4	43.36	5	67.9	24	61.73	9	47.1	24	31.18	1	50.2	6	37.25	0	30.1	7
19.4	43.26	10	70.0	21	61.53	20	49.4	23	31.13	5	49.8	4	37.19	6	30.8	7
ar. 1.4	43.12	14	71.7	17	61.22	31	51.4	20	31.04	9	49.5	3	37.09	10	31.6	8
11.3	42.94	18	73.0	13	60.82	40	53.0	16	30.91	13	49.3	2	36.95	14	32.2	6
21.3	42.75	19	74.0	10	60.37	45	54.1	11	30.77	14	49.3	0	36.78	17	32.8	6
31.3	42.54	21	74.5	5	59.88	49	54.8	7	30.61	16	49.4	1	36.60	18	33.2	4
Apr. 10.3	42.33	21	74.6	1	59.39	49	55.1	3	30.45	16	49.5	1	36.41	19	33.5	3
20.2	42.13	20	74.4	2	58.91	48	54.8	3	30.30	15	49.8	3	36.24	17	33.6	1
30.2	41.95	18	73.7	7	58.46	45	54.1	7	30.16	14	50.1	3	36.08	16	33.5	1
ay 10.2	41.79	16	72.7	10	58.07	39	52.9	12	30.05	11	50.4	3	35.95	13	33.3	2
20.1	41.66	13	71.3	14	57.76	31	51.3	16	29.97	8	50.9	5	35.85	10	32.9	4
30.1	41.56	10	69.6	17	57.53	23	49.4	19	29.92	5	51.4	5	35.80	5	32.4	5
ne 9.1	41.50	6	67.6	20	57.39	14	47.2	22	29.91	1	51.9	5	35.78	2	31.9	5
19.1	41.48	2	65.4	22	57.35	4	44.8	24	29.93	2	52.5	6	35.81	3	31.2	7
29.0	41.50	2	63.1	23	57.42	7	42.2	26	29.99	6	53.1	6	35.88	7	30.5	7
July 9.0	41.56	6	60.7	24	57.58	16	39.6	26	30.08	9	53.7	6	35.99	11	29.8	7
19.0	41.65	9	58.2	25	57.83	25	37.0	26	30.21	13	54.3	6	36.14	15	29.0	8
29.0	41.79	14	55.8	24	58.17	34	34.3	27	30.36	15	54.9	6	36.32	18	28.3	7
Aug. 7.9	41.96	17	53.5	23	58.60	43	31.8	25	30.55	19	55.4	5	36.54	22	27.5	8
17.9	42.15	19	51.4	21	59.11	51	29.5	23	30.76	21	55.8	4	36.79	25	26.7	8
27.9	42.38	23	49.7	17	59.69	58	27.3	22	30.99	23	56.0	2	37.06	27	25.8	9
Sept. 6.8	42.64	26	48.3	14	60.32	63	25.4	19	31.24	25	56.1	1	37.36	30	25.0	8
16.8	42.92	28	47.3	10	61.01	69	23.7	17	31.52	28	56.0	1	37.68	32	24.2	8
26.8	43.22	30	46.8	5	61.73	72	22.3	14	31.81	29	55.6	4	38.01	33	23.3	9
Oct. 6.8	43.53	31	46.9	1	62.49	76	21.3	10	32.11	30	55.1	5	38.36	35	22.5	8
16.7	43.86	33	47.5	6	63.27	78	20.6	7	32.42	31	54.3	8	38.72	36	21.7	8
26.7	44.18	32	48.6	11	64.05	78	20.4	2	32.73	31	53.3	10	39.09	37	20.9	8
Nov. 5.7	44.51	33	50.2	16	64.82	77	20.5	1	33.05	32	52.2	11	39.46	37	20.2	7
15.7	44.82	31	52.3	21	65.57	75	21.0	5	33.36	31	50.9	13	39.82	36	19.7	5
25.6	45.11	29	54.7	24	66.28	71	22.0	10	33.66	30	49.6	13	40.17	35	19.2	5
Dec. 5.6	45.38	27	57.5	28	66.92	64	23.3	13	33.93	27	48.2	14	40.49	32	18.9	3
15.6	45.61	23	60.5	30	67.49	57	25.0	17	34.18	25	46.8	14	40.78	29	18.8	1
25.5	45.80	19	63.6	31	67.96	47	27.0	20	34.39	21	45.5	13	41.03	25	18.9	1
35.5	45.94	14	66.7	31	68.33	37	29.3	23	34.56	17	44.3	12	41.24	21	19.2	3
Sec δ, Tan δ	1.145		−0.557		2.746		+2.557		1.011		+0.149		1.179		+0.624	
Mean Place	$41^{s}.649$		$64''.88$		$56^{s}.688$		$34''.11$		$29^{s}.283$		$48''.26$		$34^{s}.926$		$23''.86$	
D′ψ α, Dω α	−0.01		−0.01		+0.06		+0.06		0.00		0.00		+0.02		+0.01	
Dψ δ, Dω δ	−0.1		+0.9		−0.1		+0.9		−0.1		+0.9		−0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Argûs. Mag. 3.3				α² Geminorum. Mag. 2.0				25 Monocerotis. Mag. 5.2				α Canis Minor Mag. 0.5		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	7 26		−43 7		7 29		+32 4		7 33		− 3 54		7 34		+ 5
	s		″		s		″		s		″		s		″
Jan. 0.5	31.87		27.2		8.90		45.7		1.66		59.2		49.58		50.5
10.5	31.97	10	30.7	35	9.07	17	46.0	3	1.80	14	61.1	19	49.73	15	49.2
20.5	32.01	4	34.1	34	9.19	12	46.5	5	1.89	9	62.8	17	49.83	10	48.0
30.5	31.98	3	37.3	32	9.25	6	47.2	7	1.93	4	64.3	15	49.88	5	47.0
Feb. 9.4	31.89	9	40.2	29	9.25	0	47.9	7	1.93	0	65.6	13	49.88	0	46.2
19.4	31.75	14	42.8	26	9.20	5	48.7	8	1.88	5	66.6	10	49.83	5	45.6
Mar. 1.4	31.57	18	45.0	22	9.10	10	49.5	8	1.78	10	67.5	9	49.74	9	45.1
11.3	31.34	23	46.7	17	8.96	14	50.2	7	1.66	12	68.1	6	49.62	12	44.9
21.3	31.09	25	48.0	13	8.79	17	50.7	5	1.52	14	68.5	4	49.48	14	44.7
31.3	30.83	26	48.8	8	8.61	18	51.2	5	1.36	16	68.6	1	49.32	16	44.7
Apr. 10.3	30.56	27	49.1	3	8.43	18	51.5	3	1.20	16	68.6	0	49.16	16	44.8
20.2	30.30	26	48.9	2	8.25	18	51.6	1	1.04	16	68.3	3	49.01	15	45.1
30.2	30.05	25	48.3	6	8.09	16	51.6	0	0.90	14	67.9	4	48.87	14	45.4
May 10.2	29.83	22	47.2	11	7.96	13	51.4	2	0.78	12	67.3	6	48.76	11	45.8
20.2	29.64	19	45.7	15	7.86	10	51.0	4	0.69	9	66.5	8	48.67	9	46.3
30.1	29.48	16	43.8	19	7.79	7	50.5	5	0.63	6	65.6	9	48.61	6	46.9
June 9.1	29.37	11	41.6	22	7.77	2	50.0	5	0.60	3	64.6	10	48.59	2	47.5
19.1	29.31	6	39.1	25	7.79	2	49.3	7	0.60	0	63.4	12	48.60	1	48.2
29.0	29.29	2	36.4	27	7.85	6	48.6	7	0.64	4	62.2	12	48.65	5	48.9
July 9.0	29.31	2	33.5	29	7.96	11	47.8	8	0.71	7	60.9	13	48.73	8	49.7
19.0	29.38	7	30.6	29	8.10	14	47.0	8	0.82	11	59.6	13	48.84	11	50.4
29.0	29.50	12	27.8	28	8.28	18	46.2	8	0.96	14	58.4	12	48.99	15	51.0
Aug. 7.9	29.67	17	25.1	27	8.49	21	45.4	8	1.12	16	57.3	11	49.16	17	51.6
17.9	29.87	20	22.6	25	8.73	24	44.5	9	1.31	19	56.3	10	49.36	20	52.1
27.9	30.12	25	20.4	22	9.00	27	43.6	9	1.53	22	55.5	8	49.58	22	52.4
Sept. 6.9	30.40	28	18.6	18	9.29	29	42.7	9	1.77	24	55.0	5	49.82	24	52.5
16.8	30.71	31	17.3	13	9.61	32	41.8	9	2.03	26	54.7	3	50.09	27	52.4
26.8	31.04	33	16.5	8	9.94	33	41.0	8	2.30	27	54.8	1	50.37	28	52.1
Oct. 6.8	31.39	35	16.3	2	10.29	35	40.1	9	2.60	30	55.2	4	50.66	29	51.5
16.7	31.76	37	16.7	4	10.65	36	39.2	9	2.90	30	55.9	7	50.97	31	50.6
26.7	32.13	37	17.8	11	11.02	37	38.4	8	3.20	30	57.0	11	51.28	31	49.6
Nov. 5.7	32.49	36	19.4	16	11.39	37	37.6	8	3.51	31	58.3	13	51.59	31	48.3
15.7	32.84	35	21.6	22	11.75	36	37.0	6	3.82	31	59.9	16	51.90	31	46.8
25.6	33.17	33	24.2	26	12.10	35	36.5	5	4.11	29	61.8	19	52.20	30	45.3
Dec. 5.6	33.46	29	27.2	30	12.43	33	36.2	3	4.38	27	63.7	19	52.48	28	43.7
15.6	33.71	25	30.5	33	12.72	29	36.0	2	4.63	25	65.7	20	52.73	25	42.1
25.6	33.90	19	34.0	35	12.98	26	36.1	1	4.84	21	67.7	20	52.94	21	40.5
35.5	34.04	14	37.5	35	13.19	21	36.3	2	5.01	17	69.6	19	53.12	18	39.1
Sec δ, Tan δ	1.370		−0.937		1.180		+0.627		1.002		−0.068		1.004		+0.095
Mean Place	30ˢ.095		36″.45		6ˢ.903		42″.13		0ˢ.118		65″.26		48ˢ.049		45″.67
D′ψ α, Dω α	−0.02		−0.02		+0.02		+0.02		0.00		0.00		0.00		0.00
Dψ δ, Dω δ	−0.1		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**24 Lyncis.** Mag. 5.0				**κ Geminorum.** Mag. 3.7				**β Geminorum.** Mag. 1.2				**4 Puppis.** Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 7 35		° ′ +58 54		h m 7 39		° ′ +24 36		h m 7 40		° ′ +28 13		h m 7 41		° ′ −14 21	
	s		″		s		″		s		″		s		″	
Jan. 0.5	47.62	25	48.0	18	17.32	18	21.6	2	5.24	18	68.3	1	60.77	14	7.7	24
10.5	47.87	17	49.8	21	17.50	12	21.4	0	5.42	13	68.4	3	60.91	10	10.1	23
20.5	48.04	7	51.9	21	17.62	7	21.4	2	5.55	7	68.7	4	61.01	4	12.4	21
30.5	48.11	2	54.0	21	17.69	2	21.6	4	5.62	1	69.1	5	61.05	1	14.5	19
Feb. 9.4	48.09	10	56.1	20	17.71	4	22.0	4	5.63	4	69.6	6	61.04	6	16.4	16
19.4	47.99	18	58.1	18	17.67	9	22.4	4	5.59	9	70.2	6	60.98	9	18.0	13
Mar. 1.4	47.81	25	59.9	15	17.58	12	22.8	5	5.50	12	70.8	6	60.89	13	19.3	10
11.4	47.56	29	61.4	12	17.46	15	23.3	4	5.38	16	71.4	5	60.76	15	20.3	7
21.3	47.27	32	62.6	8	17.31	16	23.7	4	5.22	17	71.9	5	60.61	17	21.0	5
31.3	46.95	33	63.4	4	17.15	17	24.1	3	5.05	17	72.4	3	60.44	17	21.5	1
Apr. 10.3	46.62	33	63.8	0	16.98	16	24.4	2	4.88	17	72.7	2	60.27	16	21.6	2
20.2	46.29	30	63.8	4	16.82	15	24.6	1	4.71	16	72.9	1	60.11	16	21.4	4
30.2	45.99	26	63.4	8	16.67	13	24.7	0	4.55	14	73.0	1	59.95	13	21.0	7
May 10.2	45.73	22	62.6	12	16.54	10	24.7	0	4.41	10	72.9	1	59.82	11	20.3	10
20.2	45.51	15	61.4	15	16.44	6	24.7	2	4.31	7	72.8	3	59.71	8	19.3	12
30.1	45.36	9	59.9	17	16.38	2	24.5	2	4.24	2	72.5	4	59.63	5	18.1	14
June 9.1	45.27	3	58.2	20	16.36	1	24.3	2	4.22	1	72.1	4	59.58	1	16.7	16
19.1	45.24	5	56.2	21	16.37	5	24.1	3	4.23	5	71.7	5	59.57	2	15.1	17
29.1	45.29	12	54.1	22	16.42	9	23.8	4	4.28	8	71.2	6	59.59	6	13.4	17
July 9.0	45.41	18	51.9	23	16.51	12	23.4	4	4.36	13	70.6	6	59.65	9	11.7	18
19.0	45.59	24	49.6	22	16.63	16	23.0	4	4.49	16	70.0	6	59.74	12	9.9	17
29.0	45.83	30	47.4	23	16.79	19	22.6	5	4.65	19	69.4	7	59.86	15	8.2	16
Aug. 7.9	46.13	35	45.1	21	16.98	22	22.1	5	4.84	22	68.7	7	60.01	18	6.6	15
17.9	46.48	41	43.0	20	17.20	24	21.6	6	5.06	25	68.0	8	60.19	21	5.1	12
27.9	46.89	44	41.0	19	17.44	26	21.0	7	5.31	27	67.2	8	60.40	23	3.9	10
Sept. 6.9	47.33	49	39.1	17	17.70	29	20.3	7	5.58	30	66.4	9	60.63	25	2.9	6
16.8	47.82	51	37.4	14	17.99	31	19.6	8	5.88	31	65.5	9	60.88	28	2.3	2
26.8	48.33	54	36.0	12	18.30	32	18.8	9	6.19	33	64.6	10	61.16	29	2.1	2
Oct. 6.8	48.87	56	34.8	9	18.62	34	17.9	9	6.52	35	63.6	9	61.45	30	2.3	7
16.8	49.43	57	33.9	6	18.96	34	17.0	10	6.87	35	62.7	9	61.75	31	3.0	10
26.7	50.00	57	33.3	3	19.30	35	16.0	10	7.22	36	61.8	10	62.06	31	4.0	15
Nov. 5.7	50.57	56	33.0	0	19.65	35	15.0	9	7.58	36	60.8	8	62.37	31	5.5	18
15.7	51.13	53	33.0	5	20.00	33	14.1	9	7.94	34	60.0	7	62.68	30	7.3	21
25.6	51.66	50	33.5	8	20.33	31	13.2	7	8.28	32	59.3	6	62.98	28	9.4	23
Dec. 5.6	52.16	45	34.3	11	20.64	29	12.5	6	8.60	30	58.7	5	63.26	25	11.7	24
15.6	52.61	38	35.4	15	20.93	25	11.9	5	8.90	26	58.2	2	63.51	21	14.1	25
25.6	52.99	31	36.9	17	21.18	21	11.4	3	9.16	21	58.0	1	63.72	17	16.6	26
35.5	53.30		38.6		21.39		11.1		9.37		57.9		63.89		19.2	
Sec δ, Tan δ	1.937		+1.659		1.100		+0.458		1.135		+0.537		1.032		−0.256	
Mean Place	44s.298		46″.08		15s.496		18″.14		3s.342		65″.24		59s.272		14″.68	
D′ψ a, Dω a	+0.04		+0.04		+0.01		+0.01		+0.01		+0.02		−0.01		−0.01	
Dψ δ, Dω δ	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ξ Argûs. Mag. 3.5				φ Geminorum. Mag. 5.0				26 Lyncis. Mag. 5.7				Groombridge 1374. Mag. 5.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 7 45		° ′ −24 38		h m 7 48		° ′ +26 59		h m 7 48		° ′ +47 47		h m 7 49		° ′ +74 8	
	s		″		s		″		s		″		s		″	
Jan. 0.5	42.15		27.7		16.07		24.3		29.94		20.0		61.76		57.6	
10.5	42.29	14	30.6	29	16.26	19	24.3	0	30.17	23	21.2	12	62.20	44	60.1	25
20.5	42.38	9	33.4	28	16.40	14	24.4	1	30.33	16	22.7	15	62.49	29	62.8	27
30.5	42.41	3	36.0	26	16.47	7	24.8	4	30.42	9	24.2	15	62.60	11	65.6	28
Feb. 9.4	42.39	2	38.4	24	16.50	3	25.2	4	30.44	2	25.8	16	62.55	5	68.3	27
19.4	42.33	6	40.5	21	16.47	3	25.7	5	30.39	5	27.4	16	62.33	22	70.9	26
Mar. 1.4	42.22	11	42.2	17	16.39	8	26.3	6	30.27	12	28.9	15	61.97	36	73.2	23
11.4	42.07	15	43.6	14	16.27	12	26.9	6	30.11	16	30.2	13	61.49	48	75.1	19
21.3	41.90	17	44.7	11	16.12	15	27.4	5	29.90	21	31.3	11	60.91	58	76.7	16
31.3	41.72	18	45.3	6	15.96	16	27.9	5	29.67	23	32.1	8	60.27	64	77.8	11
Apr. 10.3	41.53	19	45.6	3	15.79	17	28.3	4	29.43	24	32.6	5	59.59	68	78.3	5
20.2	41.34	19	45.5	1	15.62	17	28.5	2	29.20	23	32.8	2	58.91	68	78.3	0
30.2	41.17	17	45.1	4	15.47	15	28.6	1	28.98	22	32.6	2	58.27	64	77.8	5
May 10.2	41.01	16	44.3	8	15.33	14	28.6	0	28.78	20	32.2	4	57.68	59	76.8	10
20.2	40.88	13	43.2	11	15.23	10	28.5	1	28.62	16	31.5	7	57.18	50	75.4	14
30.1	40.78	10	41.8	14	15.16	7	28.3	2	28.51	11	30.5	10	56.77	41	73.5	19
June 9.1	40.71	7	40.1	17	15.12	4	28.0	3	28.44	7	29.2	13	56.47	30	71.3	22
19.1	40.68	3	38.2	19	15.13	1	27.7	3	28.43	1	27.8	14	56.30	17	68.8	25
29.1	40.69	1	36.1	21	15.17	4	27.2	5	28.47	4	26.3	15	56.25	5	66.1	27
July 9.0	40.73	4	34.0	21	15.25	8	26.7	5	28.56	9	24.6	17	56.33	8	63.2	29
19.0	40.80	7	31.7	23	15.37	12	26.2	5	28.70	14	22.9	17	56.54	21	60.3	29
29.0	40.91	11	29.5	22	15.52	15	25.6	6	28.88	18	21.1	18	56.87	33	57.3	30
Aug. 7.9	41.06	15	27.4	21	15.70	18	24.9	7	29.11	23	19.4	17	57.33	46	54.4	29
17.9	41.23	17	25.5	19	15.91	21	24.2	7	29.38	27	17.6	18	57.89	56	51.7	27
27.9	41.44	21	23.9	16	16.15	24	23.5	7	29.68	30	15.9	17	58.55	66	49.1	26
Sept. 6.9	41.67	23	22.6	13	16.42	27	22.6	9	30.02	34	14.3	16	59.30	75	46.7	24
16.8	41.93	26	21.6	10	16.71	29	21.7	9	30.39	37	12.7	16	60.13	83	44.5	22
26.8	42.21	28	21.1	5	17.01	30	20.8	9	30.79	40	11.3	14	61.03	90	42.7	18
Oct. 6.8	42.51	30	21.1	0	17.34	33	19.8	10	31.21	42	10.0	13	61.98	95	41.2	15
16.8	42.82	31	21.6	5	17.68	34	18.8	10	31.65	44	8.9	11	62.97	99	40.1	11
26.7	43.14	32	22.6	10	18.03	35	17.8	10	32.10	45	8.0	9	63.98	101	39.5	6
Nov. 5.7	43.47	33	24.1	15	18.39	36	16.8	10	32.56	46	7.4	6	65.00	102	39.3	2
15.7	43.79	32	26.0	19	18.74	35	15.8	10	33.01	45	7.0	4	65.99	99	39.5	2
25.6	44.09	30	28.4	24	19.08	34	15.0	8	33.45	44	6.8	2	66.94	95	40.2	7
Dec. 5.6	44.38	29	31.0	26	19.41	33	14.3	7	33.86	41	7.0	2	67.83	89	41.4	12
15.6	44.63	25	33.8	28	19.71	30	13.7	6	34.24	38	7.5	5	68.62	79	43.0	16
25.6	44.84	21	36.7	29	19.97	26	13.4	3	34.57	33	8.3	8	69.29	67	45.0	20
35.5	45.01	17	39.6	29	20.19	22	13.2	2	34.84	27	9.4	11	69.83	54	47.3	23
Sec δ, Tan δ	1.100		−0.459		1.122		+0.509		1.488		+1.102		3.661		+3.522	
Mean Place	40^s.642		35″.80		14^s.205		21″.61		27^s.390		18″.83		55^s.560		57″.40	
D′$_\psi$ α, D$_\omega$ α	−0.01		−0.01		+0.01		+0.02		+0.03		+0.03		+0.08		+0.11	
D$_\psi$ δ, D$_\omega$ δ	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	χ Argûs. Mag. 3.6				ω Cancri. Mag. 5.9				χ Geminorum. Mag. 5.0				27 Lyncis. Mag. 4.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 54		−52 44		7 55		+25 37		7 58		+28 2		8 1		+51 45	
	s		″		s		″		s		″		s		″	
Jan. 0.6	37.45		53.9		45.60		46.9		16.24		12.4		62.56		20.1	
10.5	37.58	13	57.7	38	45.80	20	46.8	1	16.45	21	12.4	0	62.83	27	21.5	14
20.5	37.64	6	61.4	37	45.94	14	46.9	1	16.59	14	12.6	2	63.02	19	23.1	16
30.5	37.63	1	64.9	35	46.02	8	47.1	2	16.68	9	13.0	4	63.14	12	24.8	17
Feb. 9.4	37.54	9	68.3	34	46.05	3	47.4	3	16.72	4	13.5	5	63.17	3	26.6	18
19.4	37.39	15	71.3	30	46.03	2	47.9	5	16.69	3	14.1	6	63.13	4	28.4	18
Mar. 1.4	37.18	21	74.0	27	45.96	7	48.4	5	16.62	7	14.8	7	63.02	11	30.2	18
11.4	36.92	26	76.2	22	45.85	11	49.0	6	16.51	11	15.4	6	62.85	17	31.7	15
21.3	36.62	30	78.0	18	45.71	14	49.5	5	16.37	14	16.0	6	62.63	22	33.0	13
31.3	36.30	32	79.3	13	45.55	16	50.0	5	16.21	16	16.6	6	62.38	25	34.0	10
Apr. 10.3	35.97	33	80.1	8	45.38	17	50.4	4	16.04	17	17.0	4	62.12	26	34.6	6
20.3	35.64	33	80.4	3	45.22	16	50.7	3	15.87	17	17.3	3	61.86	26	34.9	3
30.2	35.32	32	80.2	2	45.06	16	50.8	1	15.71	16	17.5	2	61.61	25	34.9	0
May 10.2	35.02	30	79.5	7	44.93	13	50.9	1	15.57	14	17.5	0	61.39	22	34.5	4
20.2	34.75	27	78.3	12	44.83	10	50.9	0	15.46	11	17.4	1	61.20	19	33.7	8
30.1	34.52	23	76.6	17	44.75	8	50.8	1	15.38	8	17.2	2	61.06	14	32.7	10
June 9.1	34.32	20	74.6	20	44.71	4	50.5	3	15.34	4	16.8	4	60.97	9	31.4	13
19.1	34.18	14	72.2	24	44.71	0	50.2	3	15.34	0	16.4	4	60.93	4	29.8	16
29.1	34.09	9	69.5	27	44.75	4	49.9	3	15.37	3	15.9	5	60.94	1	28.1	17
July 9.0	34.05	4	66.7	28	44.82	7	49.4	5	15.44	7	15.4	5	61.01	7	26.2	19
19.0	34.07	2	63.7	30	44.93	11	48.9	5	15.55	11	14.7	7	61.13	12	24.3	19
29.0	34.14	7	60.6	31	45.07	14	48.4	5	15.69	14	14.0	7	61.31	18	22.3	20
Aug. 8.0	34.27	13	57.7	29	45.24	17	47.8	6	15.86	17	13.3	7	61.53	22	20.2	21
17.9	34.46	19	54.9	28	45.44	20	47.1	7	16.07	21	12.4	9	61.80	27	18.2	20
27.9	34.69	23	52.4	25	45.67	23	46.4	7	16.30	23	11.6	8	62.11	31	16.2	20
Sept. 6.9	34.98	29	50.2	22	45.93	26	45.6	8	16.56	26	10.6	10	62.46	35	14.3	19
16.8	35.30	32	48.5	17	46.21	28	44.7	9	16.84	28	9.6	10	62.84	38	12.5	18
26.8	35.67	37	47.3	12	46.51	30	43.7	10	17.15	31	8.6	10	63.25	41	10.8	17
Oct. 6.8	36.07	40	46.7	6	46.83	32	42.7	10	17.47	32	7.5	11	63.70	45	9.3	15
16.8	36.49	42	46.8	1	47.16	33	41.6	11	17.81	34	6.4	11	64.16	46	8.1	12
26.7	36.92	43	47.5	7	47.51	35	40.5	11	18.16	35	5.3	11	64.64	48	7.0	11
Nov. 5.7	37.35	43	48.8	13	47.86	35	39.4	11	18.52	36	4.2	11	65.13	49	6.2	8
15.7	37.77	42	50.8	20	48.22	36	38.4	10	18.88	36	3.2	10	65.62	49	5.8	4
25.7	38.16	39	53.3	25	48.56	34	37.4	10	19.23	35	2.3	9	66.09	47	5.6	2
Dec. 5.6	38.51	35	56.2	29	48.89	33	36.6	8	19.57	34	1.6	7	66.54	45	5.8	2
15.6	38.82	31	59.6	34	49.19	30	36.0	6	19.88	31	1.0	6	66.96	42	6.3	5
25.6	39.07	25	63.1	35	49.46	27	35.5	5	20.15	27	0.6	4	67.33	37	7.2	9
35.5	39.24	17	66.9	38	49.68	22	35.2	3	20.38	23	0.5	1	67.63	30	8.4	12
Sec δ, Tan δ	1.652		−1.315		1.109		+0.480		1.133		+0.532		1.615		+1.269	
Mean Place	$35^{s}.566$		$65''.10$		$43^{s}.773$		$44''.57$		$14^{s}.368$		$10''.46$		$59^{s}.808$		$20''.36$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.03		−0.04		+0.01		+0.02		+0.01		+0.02		+0.03		+0.04	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ρ Argûs. Mag. 2.9				8 H. Ursæ Majoris. Mag. 5.5				γ Argûs. Mag. 2.2				ζ Cancri (*mean*). Mag. 4.7			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 8 3		° ′ −24 3		h m 8 4		° ′ +68 43		h m 8 6		° ′ −47 4		h m 8 7		° ′ +17 54	
	s		″		s		″		s		″		s		″	
Jan. 0.6	54.32	16	12.2	29	20.90	39	41.7	22	54.67	15	47.0	36	18.59	19	31.5	7
10.5	54.48	11	15.1	28	21.29	27	43.9	24	54.82	9	50.6	37	18.78	15	30.8	5
20.5	54.59	5	17.9	27	21.56	14	46.3	26	54.91	2	54.3	35	18.93	9	30.3	3
30.5	54.64	0	20.6	24	21.70	2	48.9	25	54.93	4	57.8	33	19.02	4	30.0	1
Feb. 9.5	54.64	4	23.0	22	21.72	11	51.4	25	54.89	11	61.1	30	19.06	1	29.9	0
19.4	54.60	9	25.2	18	21.61	23	53.9	23	54.78	16	64.1	26	19.05	6	29.9	2
Mar. 1.4	54.51	13	27.0	15	21.38	32	56.2	20	54.62	21	66.7	23	18.99	9	30.1	2
11.4	54.38	16	28.5	11	21.06	40	58.2	16	54.41	24	69.0	18	18.90	13	30.3	3
21.3	54.22	17	29.6	8	20.66	45	59.8	12	54.17	26	70.8	13	18.77	14	30.6	4
31.3	54.05	19	30.4	4	20.21	49	61.0	8	53.91	28	72.1	9	18.63	16	31.0	3
Apr. 10.3	53.86	18	30.8	1	19.72	49	61.8	2	53.63	28	73.0	4	18.47	15	31.3	3
20.3	53.68	17	30.9	3	19.23	48	62.0	2	53.35	27	73.4	2	18.32	15	31.6	3
30.2	53.51	16	30.6	7	18.75	43	61.8	8	53.08	26	73.2	6	18.17	13	31.9	2
May 10.2	53.35	14	29.9	9	18.32	38	61.0	11	52.82	23	72.6	10	18.04	10	32.1	2
20.2	53.21	10	29.0	13	17.94	31	59.9	16	52.59	20	71.6	15	17.94	8	32.3	2
30.2	53.11	8	27.7	16	17.63	23	58.3	19	52.39	16	70.1	19	17.86	4	32.5	1
June 9.1	53.03	5	26.1	17	17.40	14	56.4	23	52.23	12	68.2	22	17.82	1	32.6	1
19.1	52.98	1	24.4	20	17.26	5	54.1	24	52.11	8	66.0	25	17.81	2	32.7	0
29.1	52.97	3	22.4	21	17.21	5	51.7	27	52.03	3	63.5	27	17.83	6	32.7	0
July 9.0	53.00	5	20.3	21	17.26	15	49.0	27	52.00	1	60.8	28	17.89	9	32.7	1
19.0	53.05	10	18.2	21	17.41	23	46.3	28	52.01	7	58.0	29	17.98	12	32.6	1
29.0	53.15	12	16.1	21	17.64	32	43.5	28	52.08	11	55.1	29	18.10	16	32.5	2
Aug. 8.0	53.27	16	14.0	19	17.96	41	40.7	27	52.19	16	52.2	26	18.26	18	32.3	3
17.9	53.43	19	12.1	16	18.37	48	38.0	26	52.35	21	49.6	25	18.44	20	32.0	4
27.9	53.62	22	10.5	13	18.85	55	35.4	25	52.56	25	47.1	21	18.64	24	31.6	6
Sept. 6.9	53.84	25	9.2	10	19.40	61	32.9	22	52.81	29	45.0	16	18.88	25	31.0	6
16.9	54.09	27	8.2	6	20.01	67	30.7	20	53.10	33	43.4	12	19.13	28	30.4	8
26.8	54.36	29	7.6	0	20.68	72	28.7	16	53.43	36	42.2	6	19.41	30	29.6	10
Oct. 6.8	54.65	31	7.6	4	21.40	75	27.1	14	53.79	38	41.6	0	19.71	31	28.6	11
16.8	54.96	32	8.0	9	22.15	77	25.7	9	54.17	39	41.6	7	20.02	33	27.5	11
26.7	55.28	33	8.9	14	22.92	78	24.8	5	54.56	40	42.3	12	20.35	34	26.4	13
Nov. 5.7	55.61	32	10.3	19	23.70	78	24.3	1	54.96	39	43.5	19	20.69	34	25.1	13
15.7	55.93	31	12.2	22	24.48	75	24.2	3	55.35	37	45.4	24	21.03	33	23.8	12
25.7	56.24	30	14.4	25	25.23	71	24.5	8	55.72	35	47.8	28	21.36	32	22.6	12
Dec. 5.6	56.54	27	16.9	28	25.94	64	25.3	12	56.07	30	50.6	32	21.68	29	21.4	12
15.6	56.81	23	19.7	29	26.58	56	26.5	17	56.37	25	53.8	35	21.97	26	20.2	10
25.6	57.04	19	22.6	30	27.14	46	28.2	20	56.62	20	57.3	36	22.23	23	19.2	8
35.5	57.23		25.6		27.60		30.2		56.82		60.9		22.46		18.4	
Sec δ, Tan δ	1.095		−0.446		2.756		+2.569		1.469		−1.075		1.051		+0.323	
Mean Place	52ˢ.873		20″.39		16ˢ.208		42″.92		52ˢ.997		58″.11		16ˢ.908		28″.86	
D′ψ α, Dω α	−0.01		−0.02		+0.06		+0.09		−0.02		−0.04		+0.01		+0.01	
Dψ δ, Dω δ	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**Bradley 1147.** Mag. 5.7				**20 Puppis.** Mag. 5.0				**β Cancri.** Mag. 3.8				**31 Lyncis.** Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 8 8		° ′ +76 0		h m 8 9		° ′ −15 31		h m 8 11		° ′ + 9 26		h m 8 16		° ′ +43 27	
	s		″		s		″		s		″		s		″	
Jan. 0.6	53.19		73.5		24.23		35.3		52.71		68.3		59.61		53.0	
10.5	53.75	56	75.9	24	24.40	17	37.9	26	52.90	19	67.1	12	59.86	25	53.8	8
20.5	54.13	38	78.6	27	24.52	12	40.3	24	53.04	14	66.1	10	60.06	20	54.8	10
30.5	54.32	19	81.4	28	24.59	7	42.6	23	53.13	9	65.3	8	60.18	12	56.1	13
Feb. 9.5	54.31	1	84.2	28	24.60	1	44.6	20	53.17	4	64.6	7	60.24	6	57.5	14
19.4	54.13	18	86.9	27	24.57	3	46.4	18	53.16	1	64.2	4	60.23	1	58.9	14
Mar. 1.4	53.77	36	89.4	25	24.50	7	47.9	15	53.11	5	63.9	3	60.16	7	60.4	15
11.4	53.27	50	91.6	22	24.39	11	49.1	12	53.02	9	63.8	1	60.03	13	61.7	13
21.3	52.65	62	93.4	18	24.25	14	50.0	9	52.90	12	63.8	0	59.87	16	62.9	12
31.3	51.94	71	94.7	13	24.10	15	50.6	6	52.76	14	63.9	1	59.67	20	63.9	10
Apr. 10.3	51.18	76	95.5	8	23.93	17	50.8	2	52.61	15	64.1	2	59.46	21	64.6	7
20.3	50.41	77	95.7	2	23.77	16	50.8	0	52.46	15	64.4	3	59.25	21	65.0	4
30.2	49.66	75	95.4	3	23.61	16	50.5	3	52.32	14	64.7	3	59.04	21	65.2	2
May 10.2	48.96	70	94.6	8	23.47	14	49.9	6	52.20	12	65.1	4	58.86	18	65.1	1
20.2	48.33	63	93.3	13	23.35	12	49.1	8	52.09	11	65.5	4	58.70	16	64.7	4
30.2	47.81	52	91.6	17	23.25	10	48.0	11	52.02	7	65.9	4	58.58	12	64.0	7
June 9.1	47.40	41	89.4	22	23.19	6	46.8	12	51.97	5	66.4	5	58.50	8	63.1	9
19.1	47.13	27	87.0	24	23.16	3	45.3	15	51.96	1	66.8	4	58.46	4	62.0	11
29.1	46.99	14	84.3	27	23.15	1	43.7	16	51.97	1	67.3	5	58.47	1	60.7	13
July 9.0	47.00	1	81.4	29	23.18	3	42.0	17	52.02	5	67.7	4	58.52	5	59.3	14
19.0	47.15	15	78.3	31	23.25	7	40.2	18	52.10	8	68.1	4	58.61	9	57.7	16
29.0	47.44	29	75.3	30	23.34	9	38.5	17	52.21	11	68.5	4	58.75	14	56.1	16
Aug. 8.0	47.86	42	72.2	31	23.47	13	36.9	16	52.35	14	68.8	3	58.93	18	54.4	17
17.9	48.41	55	69.2	30	23.62	15	35.4	15	52.52	17	68.9	1	59.14	21	52.7	17
27.9	49.08	67	66.4	28	23.81	19	34.1	13	52.71	19	68.9	0	59.40	26	50.9	18
Sept. 6.9	49.86	78	63.7	27	24.02	21	33.1	10	52.93	22	68.8	1	59.68	28	49.2	17
16.9	50.74	88	61.3	24	24.25	23	32.4	7	53.18	25	68.4	4	60.00	32	47.5	17
26.8	51.70	96	59.2	21	24.51	26	32.2	2	53.44	26	67.9	5	60.35	35	45.9	16
Oct. 6.8	52.74	104	57.5	17	24.80	29	32.3	1	53.73	29	67.1	8	60.73	38	44.4	15
16.8	53.82	108	56.1	14	25.09	29	32.8	5	54.03	30	66.2	9	61.12	39	42.9	15
26.7	54.94	112	55.1	10	25.40	31	33.8	10	54.34	31	65.0	12	61.54	42	41.7	12
Nov. 5.7	56.07	113	54.6	5	25.72	32	35.2	14	54.67	33	63.7	13	61.96	42	40.6	11
15.7	57.19	112	54.6	0	26.04	32	37.0	18	55.00	33	62.2	15	62.39	43	39.7	9
25.7	58.28	109	55.1	5	26.35	31	39.0	20	55.32	32	60.7	15	62.81	42	39.1	6
Dec. 5.6	59.30	102	56.1	10	26.65	30	41.4	24	55.62	30	59.1	16	63.22	41	38.8	3
15.6	60.22	92	57.5	14	26.92	27	43.9	25	55.91	29	57.6	15	63.60	38	38.8	0
25.6	61.03	81	59.4	19	27.16	24	46.5	26	56.16	25	56.1	15	63.94	34	39.2	4
35.6	61.68	65	61.6	22	27.36	20	49.1	26	56.38	22	54.8	13	64.23	29	39.8	6
Sec δ, Tan δ	4.140		+4.017		1.038		−0.278		1.014		+0.166		1.378		+0.948	
Mean Place	46ˢ.222		75″.26		22ˢ.798		42″.40		51ˢ.148		64″.83		57ˢ.293		53″.86	
D′ψα, Dωα	+0.09		+0.14		−0.01		−0.01		0.00		+0.01		+0.02		+0.04	
Dψδ, Dωδ	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	d^1 Cancri. Mag. 5.9				ε Argûs. Mag. 1.7				30 Monocerotis. Mag. 4.0				o Ursæ Majoris Mag. 3.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declin tion
	h m 8 18		° ′ +18 36		h m 8 20		° ′ −59 13		h m 8 21		° ′ − 3 37		h m 8 23		° +61
	s		″		s		″		s		″		s		″
Jan. 0.6	28.17		34.5		46.96		44.0		23.30		25.4		11.38		21.6
10.5	28.38	21	33.8	7	47.14	18	47.8	38	23.49	19	27.4	20	11.74	36	23.2
20.5	28.53	15	33.3	5	47.24	10	51.7	39	23.63	14	29.2	18	12.00	26	25.2
30.5	28.64	11	33.1	2	47.25	1	55.5	38	23.72	9	30.9	17	12.16	16	27.4
Feb. 9.5	28.69	5	33.0	1	47.18	7	59.1	36	23.76	4	32.3	14	12.23	7	29.6
19.4	28.69	0	33.1	1	47.02	16	62.4	33	23.76	0	33.5	12	12.20	3	31.9
Mar. 1.4	28.64	5	33.3	2	46.80	22	65.5	31	23.71	5	34.5	10	12.07	13	34.0
11.4	28.55	9	33.6	3	46.52	28	68.1	26	23.62	9	35.2	7	11.87	20	36.0
21.4	28.43	12	34.0	4	46.18	34	70.4	23	23.50	12	35.7	5	11.61	26	37.7
31.3	28.29	14	34.3	3	45.82	36	72.1	17	23.36	14	35.9	2	11.30	31	39.0
Apr. 10.3	28.14	15	34.7	4	45.43	39	73.4	13	23.21	15	36.0	1	10.96	34	40.0
20.3	27.98	16	35.1	4	45.03	40	74.1	7	23.06	15	35.9	1	10.61	35	40.5
30.2	27.84	14	35.4	3	44.64	39	74.3	2	22.92	14	35.6	3	10.27	34	40.5
May 10.2	27.71	13	35.6	2	44.26	38	74.0	3	22.79	13	35.1	5	9.95	32	40.1
20.2	27.60	11	35.8	2	43.91	35	73.1	9	22.68	11	34.5	6	9.67	28	39.3
30.2	27.52	8	36.0	2	43.60	31	71.8	13	22.60	8	33.7	8	9.44	23	38.1
June 9.1	27.47	5	36.1	1	43.32	28	70.1	17	22.54	6	32.8	9	9.26	18	36.6
19.1	27.45	2	36.2	1	43.09	23	67.9	22	22.51	3	31.8	10	9.15	11	34.8
29.1	27.46	1	36.1	1	42.92	17	65.4	25	22.51	0	30.8	10	9.11	4	32.7
July 9.1	27.51	5	36.1	0	42.81	11	62.7	27	22.54	3	29.7	11	9.13	2	30.4
19.0	27.59	8	35.9	2	42.76	5	59.7	30	22.60	6	28.6	11	9.22	9	28.0
29.0	27.70	11	35.7	2	42.78	2	56.6	31	22.69	9	27.5	11	9.38	16	25.5
Aug. 8.0	27.84	14	35.5	2	42.87	9	53.6	30	22.81	12	26.5	10	9.60	22	22.9
17.9	28.01	17	35.1	4	43.02	15	50.6	30	22.96	15	25.7	8	9.88	28	20.3
27.9	28.21	20	34.6	5	43.24	22	47.9	27	23.14	18	25.0	7	10.23	35	17.8
Sept. 6.9	28.43	22	34.0	6	43.53	29	45.5	24	23.34	20	24.5	5	10.62	39	15.4
16.9	28.68	25	33.2	8	43.87	34	43.4	21	23.57	23	24.3	2	11.06	44	13.1
26.8	28.96	28	32.3	9	44.26	39	41.9	15	23.82	25	24.5	2	11.55	49	11.0
Oct. 6.8	29.25	29	31.3	10	44.70	44	41.0	9	24.10	28	24.9	4	12.08	53	9.2
16.8	29.56	31	30.2	11	45.17	47	40.6	4	24.39	29	25.6	7	12.64	56	7.6
26.8	29.89	33	28.9	13	45.66	49	41.0	4	24.70	31	26.7	11	13.22	58	6.3
Nov. 5.7	30.23	34	27.6	13	46.16	50	42.0	10	25.01	31	28.1	14	13.82	60	5.4
15.7	30.57	34	26.3	13	46.65	49	43.6	16	25.33	32	29.7	16	14.43	61	4.8
25.7	30.90	33	24.9	14	47.12	47	45.8	22	25.65	32	31.6	19	15.02	59	4.6
Dec. 5.6	31.23	33	23.7	12	47.55	43	48.6	28	25.95	30	33.6	20	15.59	57	4.9
15.6	31.53	30	22.5	12	47.93	38	51.8	32	26.23	28	35.7	21	16.12	53	5.6
25.6	31.80	27	21.5	10	48.24	31	55.3	35	26.48	25	37.8	21	16.59	47	6.7
35.6	32.04	24	20.7	8	48.47	23	59.1	38	26.70	22	39.9	21	16.99	40	8.2
Sec δ, Tan δ	1.055		+0.337		1.955		−1.680		1.002		−0.063		2.063		+1.804
Mean Place	$26^{s}.499$		$32''.57$		$45^{s}.013$		$56''.92$		$21^{s}.869$		$30''.56$		$7^{s}.895$		$24''.30$
$D'_\psi a$, $D_\omega a$	+0.01		+0.01		−0.04		−0.06		0.00		0.00		+0.04		+0.07
$D_\psi \delta$, $D_\omega \delta$	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Chamæleontis. Mag. 4.3				Groombridge 1450. Mag. 6.0				η Cancri. Mag. 5.5				Groombridge 1446. Mag. 6.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	8 23		−77 12		8 27		+38 18		8 27		+20 43		8 30		+73 55	
	s		″		s		″		s		″		s		″	
Jan. 0.6	18.29		12.6		21.91		42.6		45.97		63.6		16.49		49.6	
10.5	18.54	25	16.3	37	22.16	25	43.1	5	46.19	22	63.0	6	17.06	57	51.8	22
20.5	18.61	7	20.2	39	22.36	20	43.8	7	46.36	17	62.6	4	17.47	41	54.3	25
30.5	18.49	12	24.1	39	22.49	13	44.7	9	46.47	11	62.4	2	17.71	24	57.0	27
Feb. 9.5	18.18	31	27.8	37	22.56	7	45.8	11	46.53	6	62.5	1	17.79	8	59.7	27
19.4	17.71	47	31.3	35	22.56	0	47.0	12	46.54	1	62.7	2	17.71	8	62.4	27
Mar. 1.4	17.09	62	34.6	33	22.51	5	48.2	12	46.50	4	63.0	3	17.47	24	65.0	26
11.4	16.34	75	37.5	29	22.41	10	49.4	12	46.42	8	63.4	4	17.09	38	67.3	23
21.4	15.48	86	40.0	25	22.27	14	50.5	11	46.31	11	63.9	5	16.60	49	69.3	20
31.3	14.54	94	42.0	20	22.10	17	51.4	9	46.17	14	64.3	4	16.02	58	70.8	15
Apr. 10.3	13.54	100	43.5	15	21.91	19	52.2	8	46.02	15	64.8	5	15.39	63	71.9	11
20.3	12.52	102	44.5	10	21.72	19	52.7	5	45.87	15	65.2	4	14.73	66	72.4	5
30.2	11.49	103	45.0	5	21.53	19	53.0	3	45.72	15	65.5	3	14.08	65	72.4	0
May 10.2	10.49	100	45.0	0	21.36	17	53.0	0	45.58	14	65.8	3	13.46	62	71.9	5
20.2	9.52	97	44.4	6	21.22	14	52.8	2	45.47	11	66.0	2	12.89	57	70.9	10
30.2	8.63	89	43.3	11	21.10	12	52.4	4	45.38	9	66.1	1	12.40	49	69.4	15
June 9.1	7.82	81	41.8	15	21.02	8	51.7	7	45.32	6	66.1	0	12.01	39	67.5	19
19.1	7.12	70	39.8	20	20.98	4	50.9	8	45.29	3	66.1	0	11.72	29	65.2	23
29.1	6.54	58	37.4	24	20.98	0	49.9	10	45.30	1	66.0	1	11.54	18	62.7	25
July 9.1	6.11	43	34.7	27	21.02	4	48.7	12	45.34	4	65.8	2	11.49	5	59.9	28
19.0	5.82	29	31.7	30	21.10	8	47.4	13	45.41	7	65.5	3	11.55	6	56.9	30
29.0	5.70	12	28.7	30	21.22	12	46.0	14	45.51	10	65.2	3	11.74	19	53.9	30
Aug. 8.0	5.74	4	25.5	32	21.37	15	44.6	14	45.65	14	64.7	5	12.04	30	50.8	31
17.9	5.95	21	22.5	30	21.56	19	43.1	15	45.81	16	64.2	5	12.46	42	47.7	31
27.9	6.33	38	19.6	29	21.79	23	41.5	16	46.00	19	63.5	7	12.98	52	44.7	30
Sept. 6.9	6.86	53	16.9	27	22.05	26	39.9	16	46.22	22	62.8	7	13.60	62	41.9	28
16.9	7.54	68	14.7	22	22.34	29	38.3	16	46.47	25	61.9	9	14.32	72	39.3	26
26.8	8.35	81	12.9	18	22.65	31	36.8	15	46.74	27	60.9	10	15.11	79	36.9	24
Oct. 6.8	9.25	90	11.7	12	22.99	34	35.2	16	47.03	29	59.7	12	15.98	87	34.8	21
16.8	10.23	98	11.1	6	23.36	37	33.7	15	47.34	31	58.5	12	16.90	92	33.1	17
26.8	11.25	102	11.1	0	23.74	38	32.3	14	47.67	33	57.2	13	17.87	97	31.8	13
Nov. 5.7	12.28	103	11.8	7	24.14	40	31.1	12	48.01	34	55.8	14	18.86	99	31.0	8
15.7	13.28	100	13.2	14	24.54	40	30.0	11	48.36	35	54.4	14	19.85	99	30.6	4
25.7	14.22	94	15.1	19	24.94	40	29.1	9	48.70	34	53.1	13	20.82	97	30.7	1
Dec. 5.6	15.05	83	17.7	26	25.33	39	28.5	6	49.04	34	51.9	12	21.75	93	31.3	6
15.6	15.75	70	20.7	30	25.69	36	28.2	3	49.35	31	50.8	11	22.61	86	32.3	10
25.6	16.30	55	24.1	34	26.02	33	28.2	0	49.64	29	49.8	10	23.37	76	33.9	16
35.6	16.67	37	27.8	37	26.30	28	28.4	2	49.88	24	49.1	7	24.02	65	35.9	20
Sec δ, Tan δ	4.516		−4.404		1.274		+0.790		1.069		+0.379		3.613		+3.472	
Mean Place	14ˢ.365		27″.09		19ˢ.808		43″.80		44ˢ.286		62″.44		10ˢ.460		53″.54	
D′ψ α, Dω α	−0.09		−0.17		+0.02		+0.03		+0.01		+0.02		+0.07		+0.14	
Dψ δ, Dω δ	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Hydræ. Mag. 4.2				σ Hydræ. Mag. 4.5				γ Cancri. Mag. 4.7				δ Cancri. Mag. 4.2		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m 8 33		° ′ + 6 0		h m 8 34		° ′ + 3 38		h m 8 38		° ′ +21 46		h m 8 39		° + 18
	s		″		s		″		s		″		s		″
Jan. 0.6	7.76	21	18.8	15	17.28	21	42.3	16	20.40	23	43.0	6	49.63	23	16.6
10.6	7.97	16	17.3	13	17.49	16	40.7	14	20.63	18	42.4	3	49.86	18	15.8
20.5	8.13	11	16.0	10	17.65	11	39.3	13	20.81	13	42.1	1	50.04	12	15.3
30.5	8.24	6	15.0	9	17.76	5	38.0	10	20.94	7	42.0	0	50.16	8	14.9
Feb. 9.5	8.30	0	14.1	7	17.81	1	37.0	8	21.01	2	42.0	3	50.24	2	14.8
19.4	8.30	3	13.4	5	17.82	4	36.2	6	21.03	3	42.3	4	50.26	3	14.9
Mar. 1.4	8.27	7	12.9	3	17.78	7	35.6	4	21.00	7	42.7	5	50.23	7	15.1
11.4	8.20	11	12.6	1	17.71	11	35.2	2	20.93	11	43.2	5	50.16	11	15.4
21.4	8.09	13	12.5	0	17.60	12	35.0	1	20.82	14	43.7	5	50.05	13	15.8
31.3	7.96	14	12.5	2	17.48	14	34.9	1	20.68	15	44.2	5	49.92	14	16.2
Apr. 10.3	7.82	15	12.7	2	17.34	14	35.0	2	20.53	15	44.7	5	49.78	15	16.7
20.3	7.67	14	12.9	3	17.20	14	35.2	3	20.38	15	45.2	4	49.63	15	17.1
30.3	7.53	12	13.2	4	17.06	13	35.5	4	20.23	13	45.6	3	49.48	13	17.4
May 10.2	7.41	11	13.6	5	16.93	11	35.9	5	20.10	12	45.9	2	49.35	12	17.8
20.2	7.30	9	14.1	5	16.82	9	36.4	6	19.98	10	46.1	1	49.23	9	18.0
30.2	7.21	6	14.6	6	16.73	6	37.0	6	19.88	6	46.2	0	49.14	6	18.2
June 9.1	7.15	3	15.2	6	16.67	3	37.6	7	19.82	4	46.2	1	49.08	3	18.3
19.1	7.12	0	15.8	5	16.64	1	38.3	7	19.78	0	46.1	1	49.05	1	18.4
29.1	7.12	3	16.3	6	16.63	3	39.0	7	19.78	3	46.0	3	49.04	3	18.4
July 9.1	7.15	6	16.9	6	16.66	6	39.7	7	19.81	6	45.7	3	49.07	6	18.3
19.0	7.21	9	17.5	5	16.72	8	40.4	6	19.87	9	45.4	5	49.13	9	18.2
29.0	7.30	12	18.0	4	16.80	12	41.0	5	19.96	13	44.9	5	49.22	12	17.9
Aug. 8.0	7.42	14	18.4	3	16.92	14	41.5	5	20.09	15	44.4	6	49.34	15	17.6
18.0	7.56	17	18.7	1	17.06	17	42.0	2	20.24	19	43.8	8	49.49	18	17.1
27.9	7.73	20	18.8	0	17.23	20	42.2	1	20.43	21	43.0	9	49.67	20	16.5
Sept. 6.9	7.93	22	18.8	2	17.43	22	42.3	1	20.64	24	42.1	10	49.87	23	15.8
16.9	8.15	25	18.6	5	17.65	24	42.2	4	20.88	26	41.1	11	50.10	26	15.0
26.8	8.40	27	18.1	8	17.89	27	41.8	7	21.14	29	40.0	12	50.36	28	14.0
Oct. 6.8	8.67	30	17.3	9	18.16	29	41.1	9	21.43	31	38.8	13	50.64	30	12.8
16.8	8.97	30	16.4	12	18.45	31	40.2	12	21.74	32	37.5	14	50.94	33	11.6
26.8	9.27	32	15.2	15	18.76	32	39.0	14	22.06	35	36.1	14	51.27	33	10.2
Nov. 5.7	9.59	33	13.7	15	19.08	32	37.6	16	22.41	35	34.7	15	51.60	34	8.7
15.7	9.92	32	12.2	17	19.40	32	36.0	18	22.76	34	33.2	13	51.94	35	7.2
25.7	10.24	32	10.5	18	19.72	32	34.2	18	23.10	34	31.9	13	52.29	33	5.8
Dec. 5.7	10.56	29	8.7	18	20.04	29	32.4	19	23.44	33	30.6	11	52.62	32	4.4
15.6	10.85	27	6.9	17	20.33	27	30.5	18	23.77	29	29.5	10	52.94	29	3.1
25.6	11.12	23	5.2	15	20.60	23	28.7	17	24.06	26	28.5	7	53.23	25	1.9
35.6	11.35		3.7		20.83		27.0		24.32		27.8		53.48		1.0
Sec δ, Tan δ	1.006		+0.105		1.002		+0.064		1.077		+0.399		1.054		+0.334
Mean Place	6ˢ.285		15″.62		15ˢ.829		38″.74		18ˢ.724		42″.63		48ˢ.015		15″.82
D′ψ α, Dω α	0.00		0.00		0.00		0.00		+0.01		+0.02		+0.01		+0.01
Dψ δ, Dω δ	−0.2		+0.8		−0.2		+0.8		−0.3		+0.8		−0.3		+0.8

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Pyxidis. Mag. 3.7				ι Cancri. Mag. 4.2				ε Hydræ. Mag. 3.5				δ Argûs. Mag. 2.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 8 40		° ′ −32 52		h m 8 41		° ′ +29 4		h m 8 42		° ′ + 6 43		h m 8 42		° ′ −54 23	
	s		″		s		″		s		″		s		″	
Jan. 0.6	9.50		23.1		31.64		29.8		14.86		69.0		21.16		21.8	
10.6	9.69	19	26.4	33	31.88	24	29.6	2	15.08	22	67.5	15	21.38	22	25.6	38
20.5	9.84	15	29.6	32	32.08	20	29.7	1	15.24	16	66.2	13	21.52	14	29.4	38
30.5	9.92	8	32.8	32	32.22	14	30.0	3	15.36	12	65.2	10	21.58	6	33.2	38
Feb. 9.5	9.95	3	35.7	29	32.30	8	30.5	5	15.43	7	64.3	9	21.57	1	36.8	36
19.4	9.93	2	38.4	27	32.32	2	31.2	7	15.45	2	63.6	7	21.49	8	40.2	34
Mar. 1.4	9.86	7	40.8	24	32.29	3	32.0	8	15.42	3	63.2	4	21.34	15	43.4	32
11.4	9.74	12	42.9	21	32.21	8	32.8	8	15.35	7	62.9	3	21.13	21	46.1	27
21.4	9.59	15	44.6	17	32.10	11	33.7	9	15.25	10	62.8	1	20.88	25	48.5	24
31.3	9.42	17	45.9	13	31.96	14	34.5	8	15.13	12	62.9	1	20.59	29	50.4	19
Apr. 10.3	9.23	19	46.8	9	31.80	16	35.1	6	14.99	14	63.0	1	20.28	31	51.8	14
20.3	9.03	20	47.3	5	31.64	16	35.7	6	14.85	14	63.3	3	19.95	33	52.8	10
30.3	8.83	20	47.4	1	31.47	17	36.1	4	14.71	14	63.6	3	19.63	32	53.2	4
May 10.2	8.65	18	47.0	4	31.32	15	36.3	2	14.58	13	64.0	4	19.31	32	53.1	1
20.2	8.48	17	46.3	7	31.19	13	36.4	1	14.47	11	64.4	4	19.01	30	52.6	5
30.2	8.34	14	45.3	10	31.09	10	36.3	1	14.38	9	64.9	5	18.74	27	51.5	11
June 9.1	8.22	12	43.8	15	31.02	7	36.1	2	14.32	6	65.4	5	18.50	24	50.0	15
19.1	8.13	9	42.1	17	30.98	4	35.7	4	14.28	4	66.0	6	18.30	20	48.1	19
29.1	8.07	6	40.1	20	30.97	1	35.2	5	14.27	1	66.5	5	18.14	16	45.8	23
July 9.1	8.04	3	37.9	22	31.00	3	34.5	7	14.29	2	67.1	6	18.04	10	43.2	26
19.0	8.05	1	35.6	23	31.06	6	33.8	7	14.34	5	67.6	5	17.98	6	40.5	27
29.0	8.10	5	33.3	23	31.15	9	32.9	9	14.42	8	68.0	4	17.98	0	37.6	29
Aug. 8.0	8.19	9	31.0	23	31.28	13	31.9	10	14.53	11	68.4	4	18.04	6	34.6	30
18.0	8.31	12	28.7	23	31.44	16	30.9	10	14.67	14	68.6	2	18.16	12	31.7	29
27.9	8.47	16	26.7	20	31.63	19	29.7	12	14.83	16	68.7	1	18.33	17	29.0	27
Sept. 6.9	8.66	19	24.9	18	31.85	22	28.5	12	15.02	19	68.6	1	18.56	23	26.6	24
16.9	8.89	23	23.5	14	32.10	25	27.1	14	15.24	22	68.2	4	18.84	28	24.5	21
26.8	9.15	26	22.5	10	32.38	28	25.7	14	15.48	24	67.7	5	19.18	34	22.9	16
Oct. 6.8	9.44	29	22.0	5	32.68	30	24.3	14	15.75	27	66.9	8	19.56	38	21.9	10
16.8	9.75	31	22.1	1	33.00	32	22.8	15	16.04	29	65.9	10	19.97	41	21.4	5
26.8	10.09	34	22.7	6	33.35	35	21.3	15	16.35	31	64.6	13	20.41	44	21.6	2
Nov. 5.7	10.43	34	23.8	11	33.71	36	19.9	14	16.66	31	63.2	14	20.87	46	22.4	8
15.7	10.79	36	25.5	17	34.08	37	18.6	13	16.99	33	61.6	16	21.32	45	23.8	14
25.7	11.13	34	27.6	21	34.44	36	17.3	13	17.32	33	59.9	17	21.76	44	25.9	21
Dec. 5.7	11.47	34	30.2	26	34.80	36	16.2	11	17.64	32	58.1	18	22.18	42	28.5	26
15.6	11.77	30	33.0	28	35.14	34	15.4	8	17.94	30	56.4	17	22.56	38	31.5	30
25.6	12.04	27	36.1	31	35.45	31	14.8	6	18.21	27	54.7	17	22.88	32	34.9	34
35.6	12.27	23	39.4	33	35.73	28	14.4	4	18.45	24	53.1	16	23.14	26	38.6	37
Sec δ, Tan δ	1.191		−0.646		1.144		+0.556		1.007		+0.118		1.718		−1.397	
Mean Place	8ˢ.151		33″.02		29ˢ.822		30″.72		13ˢ.401		66″.21		19ˢ.546		35″.05	
D′ψα, Dωα	−0.01		−0.03		+0.01		+0.02		0.00		+0.01		−0.03		−0.06	
Dψδ, Dωδ	−0.3		+0.8		−0.3		+0.8		−0.3		+0.8		−0.3		+0.8	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ^2 Cancri (*mean*). Mag. 5.5				ζ Hydræ. Mag. 3.3				ι Ursæ Majoris. Mag. 3.1				α Cancri. Mag. 4.3		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declition
	h m 8 49		° ′ +30 54		h m 8 50		° ′ + 6 16		h m 8 53		° ′ +48 22		h m 8 53		° +12
	s		″		s		″		s		″		s		″
Jan. 0.6	1.92		19.3		52.41		27.1		22.04		43.8		48.63		29.7
10.6	2.18	26	19.2	1	52.63	22	25.6	15	22.36	32	44.7	9	48.86	23	28.5
20.5	2.39	21	19.4	2	52.81	18	24.2	14	22.61	25	45.8	11	49.04	18	27.5
30.5	2.54	15	19.8	4	52.94	13	23.1	11	22.79	18	47.3	15	49.18	14	26.7
Feb. 9.5	2.63	9	20.4	6	53.01	7	22.2	9	22.90	11	48.9	16	49.26	8	26.1
19.5	2.66	3	21.2	8	53.04	3	21.5	7	22.93	3	50.6	17	49.29	3	25.8
Mar. 1.4	2.63	3	22.1	9	53.02	2	21.0	5	22.89	4	52.4	18	49.28	1	25.7
11.4	2.56	7	23.0	9	52.96	6	20.8	2	22.79	10	54.1	17	49.22	6	25.7
21.4	2.45	11	23.9	9	52.86	10	20.6	2	22.64	15	55.6	15	49.13	9	25.8
31.3	2.31	14	24.8	9	52.74	12	20.7	1	22.45	19	57.0	14	49.01	12	26.1
Apr. 10.3	2.16	15	25.6	8	52.61	13	20.8	1	22.23	22	58.1	11	48.88	13	26.4
20.3	1.99	17	26.2	6	52.47	14	21.1	3	22.00	23	58.9	8	48.74	14	26.8
30.3	1.82	17	26.6	4	52.33	14	21.4	3	21.77	23	59.4	5	48.60	14	27.2
May 10.2	1.67	15	26.9	3	52.21	12	21.8	4	21.55	22	59.5	1	48.47	13	27.5
20.2	1.54	13	27.0	1	52.09	12	22.2	4	21.36	19	59.3	2	48.36	11	27.9
30.2	1.42	12	26.9	1	52.00	9	22.8	6	21.19	17	58.7	6	48.26	10	28.3
June 9.2	1.34	8	26.6	3	51.93	7	23.3	5	21.06	13	57.8	9	48.19	7	28.7
19.1	1.29	5	26.2	4	51.89	4	23.8	5	20.96	10	56.7	11	48.15	4	29.0
29.1	1.28	1	25.6	6	51.88	1	24.4	6	20.91	5	55.3	14	48.14	1	29.3
July 9.1	1.30	2	24.9	7	51.89	1	24.9	5	20.91	0	53.6	17	48.15	1	29.5
19.0	1.35	5	24.0	9	51.93	4	25.4	5	20.95	4	51.8	18	48.20	5	29.7
29.0	1.44	9	23.0	10	52.01	8	25.9	5	21.04	9	49.9	19	48.27	7	29.8
Aug. 8.0	1.56	12	21.9	11	52.11	10	26.2	3	21.18	14	47.8	21	48.37	10	29.8
18.0	1.71	15	20.7	12	52.24	13	26.5	3	21.35	17	45.7	21	48.50	13	29.7
27.9	1.90	19	19.4	13	52.39	15	26.6	1	21.57	22	43.5	22	48.66	16	29.4
Sept. 6.9	2.11	21	18.0	14	52.57	18	26.4	2	21.83	26	41.3	22	48.84	18	29.0
16.9	2.36	25	16.6	14	52.78	21	26.1	3	22.13	30	39.1	22	49.06	22	28.4
26.9	2.64	28	15.1	15	53.02	24	25.6	5	22.47	34	36.9	22	49.30	24	27.6
Oct. 6.8	2.94	30	13.5	16	53.28	26	24.8	8	22.84	37	34.9	20	49.56	26	26.6
16.8	3.26	32	12.0	15	53.57	29	23.8	10	23.24	40	33.0	19	49.85	29	25.4
26.8	3.61	35	10.4	16	53.87	30	22.5	13	23.67	43	31.3	17	50.16	31	24.0
Nov. 5.7	3.98	37	8.9	15	54.19	32	21.0	15	24.12	45	29.8	15	50.48	32	22.5
15.7	4.35	37	7.5	14	54.52	33	19.4	16	24.58	46	28.6	12	50.81	33	20.9
25.7	4.73	38	6.2	13	54.85	33	17.7	17	25.04	46	27.7	9	51.15	34	19.2
Dec. 5.7	5.09	36	5.2	10	55.17	32	15.9	18	25.49	45	27.2	5	51.48	33	17.6
15.6	5.44	35	4.4	8	55.47	30	14.1	18	25.92	43	27.1	1	51.79	31	16.0
25.6	5.77	33	3.8	6	55.75	28	12.3	18	26.32	40	27.3	2	52.08	29	14.5
35.6	6.05	28	3.5	3	56.00	25	10.7	16	26.67	35	27.9	6	52.34	26	13.1
Sec δ, Tan δ	1.165		+0.598		1.006		+0.110		1.506		+1.125		1.024		+0.216
Mean Place	$0^{s}.087$		$21''.02$		$50^{s}.980$		$24''.59$		$19^{s}.591$		$48''.27$		$47^{s}.140$		$28''.42$
D′ψ α, Dω α	+0.01		+0.03		0.00		0.00		+0.02		+0.05		0.00		+0.01
Dψ δ, Dω δ	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	b^1 Carinæ. Mag. 5.1				κ Ursæ Majoris. Mag. 3.7				σ^2 Ursæ Majoris. Mag. 4.9				κ Cancri. Mag. 5.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	8 54		−58 53		8 57		+47 29		9 2		+67 28		9 3		+11 0	
	s		″		s		″		s		″		s		″	
Jan. 0.6	53.74		35.8		48.06		45.9		54.91		57.8		6.91		54.7	
10.6	53.99	25	39.6	38	48.38	32	46.7	8	55.41	50	59.5	17	7.15	24	53.4	13
20.5	54.15	16	43.4	38	48.63	25	47.8	11	55.81	40	61.6	21	7.34	19	52.3	11
30.5	54.24	9	47.3	39	48.82	19	49.2	14	56.09	28	63.9	23	7.48	14	51.4	9
Feb. 9.5	54.23	1	51.1	38	48.93	11	50.7	15	56.25	16	66.4	25	7.57	9	50.8	6
19.5	54.15	8	54.7	36	48.97	4	52.4	17	56.28	3	68.9	25	7.61	4	50.3	5
Mar. 1.4	53.99	16	58.0	33	48.94	3	54.1	17	56.20	8	71.4	25	7.61	0	50.1	2
11.4	53.77	22	61.0	30	48.85	9	55.8	17	56.01	19	73.8	24	7.56	5	50.1	0
21.4	53.49	28	63.6	26	48.71	14	57.4	16	55.73	28	76.0	22	7.47	9	50.2	1
31.4	53.18	31	65.7	21	48.53	18	58.8	14	55.37	36	77.8	18	7.36	11	50.4	2
Apr. 10.3	52.83	35	67.4	17	48.32	21	60.0	12	54.96	41	79.2	14	7.24	12	50.7	3
20.3	52.46	37	68.6	12	48.09	23	60.8	8	54.53	43	80.1	9	7.10	14	51.0	3
30.3	52.09	37	69.3	7	47.87	22	61.3	5	54.08	45	80.6	5	6.96	14	51.4	4
May 10.2	51.72	37	69.4	1	47.66	21	61.5	2	53.64	44	80.6	0	6.84	12	51.9	5
20.2	51.37	35	69.0	4	47.46	20	61.3	2	53.23	41	80.1	5	6.72	12	52.3	4
30.2	51.04	33	68.2	8	47.30	16	60.8	5	52.86	37	79.1	10	6.62	10	52.7	4
June 9.2	50.75	29	66.8	14	47.16	14	60.0	8	52.55	31	77.7	14	6.55	7	53.1	4
19.1	50.50	25	65.0	18	47.07	9	58.9	11	52.30	25	75.9	18	6.50	5	53.4	3
29.1	50.29	21	62.9	21	47.03	4	57.6	13	52.13	17	73.8	21	6.48	2	53.8	4
July 9.1	50.13	16	60.4	25	47.02	1	56.0	16	52.04	9	71.4	24	6.48	0	54.0	2
19.1	50.04	9	57.6	28	47.06	4	54.2	18	52.03	1	68.7	27	6.52	4	54.3	3
29.0	50.00	4	54.7	29	47.14	8	52.3	19	52.10	7	65.9	28	6.58	6	54.4	1
Aug. 8.0	50.03	3	51.7	30	47.27	13	50.3	20	52.26	16	62.9	30	6.67	9	54.5	1
18.0	50.13	10	48.8	29	47.44	17	48.2	21	52.49	23	59.9	30	6.79	12	54.4	1
27.9	50.29	16	45.9	29	47.65	21	46.0	22	52.81	32	56.9	30	6.94	15	54.2	2
Sept. 6.9	50.52	23	43.4	25	47.90	25	43.8	22	53.19	38	54.0	29	7.12	18	53.8	4
16.9	50.81	29	41.1	23	48.19	29	41.6	22	53.65	46	51.1	29	7.32	20	53.2	6
26.9	51.16	35	39.3	18	48.52	33	39.5	21	54.18	53	48.4	27	7.55	23	52.4	8
Oct. 6.8	51.57	41	38.0	13	48.88	36	37.5	20	54.77	59	46.0	24	7.81	26	51.4	10
16.8	52.02	45	37.3	7	49.27	39	35.5	20	55.41	64	43.8	22	8.09	28	50.3	11
26.8	52.50	48	37.3	0	49.69	42	33.8	17	56.09	68	42.0	18	8.40	31	48.9	14
Nov. 5.8	53.00	50	37.9	6	50.13	44	32.3	15	56.81	72	40.6	14	8.72	32	47.3	16
15.7	53.50	50	39.1	12	50.59	46	31.0	13	57.54	73	39.6	10	9.05	33	45.7	16
25.7	54.00	50	41.0	19	51.04	45	30.0	10	58.28	74	39.0	6	9.38	33	44.0	17
Dec. 5.7	54.46	46	43.4	24	51.49	45	29.4	6	59.00	72	39.0	0	9.71	33	42.2	18
15.6	54.88	42	46.4	30	51.92	43	29.2	2	59.69	69	39.4	4	10.03	32	40.5	17
25.6	55.25	37	49.7	33	52.32	40	29.3	1	60.32	63	40.3	9	10.33	30	39.0	15
35.6	55.55	30	53.3	36	52.67	35	29.8	5	60.87	55	41.7	14	10.59	26	37.5	15
Sec δ, Tan δ	1.936		−1.658		1.480		+1.091		2.611		+2.412		1.019		+0.195	
Mean Place	52s.095		50″.04		45s.666		50″.64		50s.678		64″.80		5s.466		53″.63	
D′ψ α, Dω α	−0.03		−0.08		+0.02		+0.05		+0.04		+0.12		0.00		+0.01	
Dψ δ, Dω δ	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Argûs. Mag. 2.2				θ Hydræ. Mag. 3.8				β Argûs. Mag. 1.8				83 Cancri. Mag. 6.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 9 4 s		° ′ −43 4 ″		h m 9 9 s		° ′ + 2 40 ″		h m 9 12 s		° ′ −69 21 ″		h m 9 14 s		° ′ +18 3 ″	
Jan. 0.6	51.21		54.3		54.82		42.4		17.61		30.4		12.57		72.9	
10.6	51.45	24	57.8	35	55.05	23	40.6	18	17.96	35	34.1	37	12.83	26	71.9	10
20.6	51.62	17	61.4	36	55.25	20	39.0	16	18.19	23	38.0	39	13.04	21	71.2	7
30.5	51.73	11	64.9	35	55.39	14	37.6	14	18.31	12	41.9	39	13.20	16	70.7	5
Feb. 9.5	51.78	5	68.3	34	55.48	9	36.4	12	18.31	0	45.8	39	13.31	11	70.5	2
19.5	51.77	1	71.6	33	55.53	5	35.4	10	18.19	12	49.7	39	13.36	5	70.5	0
Mar. 1.4	51.70	7	74.5	29	55.52	1	34.7	7	17.97	22	53.3	36	13.37	1	70.7	2
11.4	51.58	12	77.1	26	55.48	4	34.2	5	17.65	32	56.6	33	13.33	4	71.0	3
21.4	51.42	16	79.4	23	55.40	8	33.9	3	17.25	40	59.6	30	13.25	8	71.5	5
31.4	51.23	19	81.2	18	55.29	11	33.8	1	16.79	46	62.1	25	13.14	11	72.0	5
Apr. 10.3	51.02	21	82.6	14	55.17	12	33.8	0	16.27	52	64.2	21	13.02	12	72.5	5
20.3	50.79	23	83.6	10	55.04	13	34.0	2	15.72	55	65.8	16	12.88	14	73.0	5
30.3	50.56	23	84.0	4	54.91	13	34.3	3	15.15	57	66.9	11	12.74	14	73.5	5
May 10.3	50.34	22	84.1	1	54.78	13	34.6	3	14.58	57	67.5	6	12.60	14	74.0	5
20.2	50.12	22	83.7	4	54.66	12	35.1	5	14.01	57	67.5	0	12.48	12	74.3	3
30.2	49.93	19	82.8	9	54.57	9	35.7	6	13.47	54	67.0	5	12.38	10	74.6	3
June 9.2	49.76	17	81.5	13	54.49	8	36.3	6	12.97	50	66.0	10	12.30	8	74.8	2
19.1	49.61	15	79.9	16	54.44	5	36.9	6	12.51	46	64.4	16	12.24	6	75.0	2
29.1	49.50	11	77.9	20	54.41	3	37.6	7	12.12	39	62.5	19	12.21	3	75.0	0
July 9.1	49.42	8	75.7	22	54.41	0	38.2	6	11.80	32	60.2	23	12.21	0	74.9	1
19.1	49.39	3	73.2	25	54.43	2	38.9	7	11.56	24	57.5	27	12.24	3	74.8	1
29.0	49.39	0	70.7	25	54.48	5	39.5	6	11.41	15	54.6	29	12.29	5	74.5	3
Aug. 8.0	49.44	5	68.0	27	54.56	8	40.0	5	11.36	5	51.6	30	12.38	9	74.1	4
18.0	49.52	8	65.5	25	54.67	11	40.4	4	11.41	5	48.5	31	12.49	11	73.6	5
28.0	49.66	14	63.1	24	54.81	14	40.6	2	11.56	15	45.5	30	12.63	14	72.9	7
Sept. 6.9	49.84	18	60.9	22	54.97	16	40.7	1	11.82	26	42.7	28	12.80	17	72.1	8
16.9	50.06	22	59.0	19	55.16	19	40.5	2	12.17	35	40.2	25	13.00	20	71.1	10
26.9	50.32	26	57.6	14	55.39	23	40.1	4	12.62	45	38.0	22	13.23	23	70.0	11
Oct. 6.8	50.62	30	56.6	10	55.64	25	39.4	7	13.15	53	36.4	16	13.49	26	68.6	14
16.8	50.96	34	56.2	4	55.91	27	38.4	10	13.75	60	35.3	11	13.78	29	67.2	14
26.8	51.32	36	56.4	2	56.20	29	37.1	13	14.41	66	34.8	5	14.08	30	65.6	16
Nov. 5.8	51.71	39	57.2	8	56.52	32	35.6	15	15.09	68	35.0	2	14.41	33	64.0	16
15.7	52.10	39	58.5	13	56.84	32	34.0	16	15.79	70	35.9	9	14.75	34	62.3	17
25.7	52.49	39	60.5	20	57.17	33	32.1	19	16.47	68	37.4	15	15.10	35	60.6	17
Dec. 5.7	52.86	37	62.9	24	57.50	33	30.1	20	17.12	65	39.5	21	15.44	34	59.0	16
15.6	53.21	35	65.7	28	57.81	31	28.1	20	17.72	60	42.2	27	15.77	33	57.5	15
25.6	53.53	32	68.9	32	58.10	29	26.2	19	18.23	51	45.4	32	16.08	31	56.2	13
35.6	53.80	27	72.4	35	58.36	26	24.3	19	18.64	41	48.9	35	16.36	28	55.0	12
Sec δ, Tan δ	1.369		−0.935		1.001		+0.047		2.837		−2.655		1.052		+0.326	
Mean Place	49ˢ.932		66″.36		53ˢ.489		39″.82		15ˢ.655		46″.37		11ˢ.071		73″.83	
D′ψ a, Dω a	−0.02		−0.04		0.00		0.00		−0.05		+0.13		+0.01		+0.02	
Dψ δ, Dω δ	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Argûs. Mag. 2.2				40 Lyncis. Mag. 3.3				θ Pyxidis. Mag. 4.9				α Hydræ. Mag. 2.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 9 14		° ′ −58 54		h m 9 15		° ′ +34 45		h m 9 17		° ′ −25 35		h m 9 23		° ′ − 8 17	
	s		″		s		″		s		″		s		″	
Jan. 0.6	48.64	28	35.6	37	51.07	29	20.5	1	42.08	24	48.9	30	22.90	24	2.2	24
10.6	48.92	21	39.3	38	51.36	24	20.4	3	42.32	19	51.9	30	23.14	20	4.6	22
20.6	49.13	12	43.1	39	51.60	18	20.7	5	42.51	13	54.9	29	23.34	14	6.8	20
30.5	49.25	4	47.0	38	51.78	12	21.2	8	42.64	8	57.8	28	23.48	10	8.8	19
Feb. 9.5	49.29	4	50.8	37	51.90	6	22.0	10	42.72	3	60.6	25	23.58	6	10.7	16
19.5	49.25	12	54.5	35	51.96	1	23.0	12	42.75	2	63.1	23	23.64	0	12.3	14
Mar. 1.4	49.13	18	58.0	31	51.97	5	24.2	12	42.73	6	65.4	20	23.64	4	13.7	11
11.4	48.95	24	61.1	28	51.92	9	25.4	12	42.67	9	67.4	16	23.60	7	14.8	8
21.4	48.71	29	63.9	24	51.83	13	26.6	11	42.58	13	69.0	13	23.53	10	15.6	6
31.4	48.42	33	66.3	19	51.70	16	27.7	10	42.45	15	70.3	10	23.43	12	16.2	4
Apr. 10.3	48.09	35	68.2	15	51.54	16	28.7	9	42.30	16	71.3	6	23.31	13	16.6	1
20.3	47.74	35	69.7	9	51.38	17	29.6	6	42.14	16	71.9	2	23.18	14	16.7	0
30.3	47.39	36	70.6	4	51.21	17	30.2	5	41.98	16	72.1	1	23.04	13	16.7	3
May 10.3	47.03	35	71.0	1	51.04	15	30.7	2	41.82	15	72.0	4	22.91	12	16.4	5
20.2	46.68	33	70.9	6	50.89	13	30.9	1	41.67	13	71.6	7	22.79	11	15.9	6
30.2	46.35	31	70.3	11	50.76	10	30.8	3	41.54	11	70.9	11	22.68	9	15.3	8
June 9.2	46.04	27	69.2	16	50.66	8	30.5	5	41.43	9	69.8	13	22.59	6	14.5	10
19.1	45.77	22	67.6	20	50.58	4	30.0	7	41.34	7	68.5	16	22.53	5	13.5	10
29.1	45.55	18	65.6	23	50.54	1	29.3	9	41.27	4	66.9	17	22.48	2	12.5	11
July 9.1	45.37	13	63.3	26	50.53	2	28.4	10	41.23	1	65.2	19	22.46	1	11.4	12
19.1	45.24	6	60.7	28	50.55	6	27.4	13	41.22	2	63.3	19	22.47	3	10.2	11
29.0	45.18	1	57.9	29	50.61	9	26.1	13	41.24	5	61.4	20	22.50	6	9.1	11
Aug. 8.0	45.17	6	55.0	30	50.70	12	24.8	15	41.29	9	59.4	18	22.56	9	8.0	10
18.0	45.23	13	52.0	28	50.82	16	23.3	16	41.38	11	57.6	18	22.65	12	7.0	9
28.0	45.36	20	49.2	27	50.98	19	21.7	17	41.49	16	55.8	15	22.77	15	6.1	6
Sept. 6.9	45.56	26	46.5	24	51.17	23	20.0	18	41.65	18	54.3	12	22.92	18	5.5	4
16.9	45.82	33	44.1	19	51.40	26	18.2	19	41.83	22	53.1	8	23.10	20	5.1	1
26.9	46.15	38	42.2	15	51.66	29	16.3	18	42.05	26	52.3	4	23.30	24	5.0	3
Oct. 6.8	46.53	44	40.7	9	51.95	32	14.5	19	42.31	28	51.9	0	23.54	27	5.3	6
16.8	46.97	47	39.8	3	52.27	35	12.6	18	42.59	31	51.9	5	23.81	29	5.9	10
26.8	47.44	50	39.5	4	52.62	36	10.8	18	42.90	33	52.4	10	24.10	31	6.9	13
Nov. 5.8	47.94	51	39.9	10	52.98	39	9.0	16	43.23	34	53.4	15	24.41	32	8.2	17
15.7	48.45	51	40.9	17	53.37	39	7.4	14	43.57	34	54.9	20	24.73	33	9.9	19
25.7	48.96	48	42.6	22	53.76	39	6.0	12	43.91	34	56.9	23	25.06	32	11.8	21
Dec. 5.7	49.44	45	44.8	28	54.15	37	4.8	9	44.25	33	59.2	26	25.38	32	13.9	23
15.7	49.89	39	47.6	32	54.52	35	3.9	6	44.58	29	61.8	28	25.70	30	16.2	24
25.6	50.28	34	50.8	35	54.87	32	3.3	3	44.87	26	64.6	30	26.00	26	18.6	23
35.6	50.62		54.3		55.19		3.0		45.13		67.6		26.26		20.9	
Sec δ, Tan δ	1.937		−1.659		1.217		+0.694		1.109		−0.479		1.011		−0.146	
Mean Place	47ˢ.178		50″.40		49ˢ.215		24″.73		40ˢ.929		57″.63		21ˢ.705		6″.89	
D′ψ α, Dω α	−0.03		−0.08		+0.01		+0.03		−0.01		−0.02		0.00		−0.01	
Dψ δ, Dω δ	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*h* Ursæ Majoris. Mag. 3.8 Right Ascension.		*h* Ursæ Majoris. Declination N.		*d* Ursæ Majoris. Mag. 4.6 Right Ascension.		*d* Ursæ Majoris. Declination N.		*θ* Ursæ Majoris. Mag. 3.3 Right Ascension.		*θ* Ursæ Majoris. Declination N.		*ψ* Argûs. Mag. 3.6 Right Ascension.		*ψ* Argûs. Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 24		+63 25		9 26		+70 12		9 27		+52 3		9 27		−40 5	
	s		″		s		″		s		″		s		″	
Jan. 0.6	49.40	47	70.4	13	58.70	60	23.6	16	9.34	37	64.2	8	19.73	25	12.5	34
10.6	49.87	39	71.7	17	59.30	49	25.2	19	9.71	31	65.0	11	19.98	20	15.9	35
20.6	50.26	30	73.4	20	59.79	37	27.1	23	10.02	24	66.1	14	20.18	15	19.4	34
30.5	50.56	19	75.4	23	60.16	23	29.4	26	10.26	16	67.5	18	20.33	8	22.8	34
Feb. 9.5	50.75	9	77.7	24	60.39	9	32.0	27	10.42	8	69.3	19	20.41	3	26.2	32
19.5	50.84	2	80.1	25	60.48	4	34.7	26	10.50	0	71.2	20	20.44	3	29.4	29
Mar. 1.5	50.82	11	82.6	24	60.44	16	37.3	26	10.50	7	73.2	19	20.41	8	32.3	27
11.4	50.71	20	85.0	22	60.28	28	39.9	24	10.43	12	75.1	19	20.33	13	35.0	23
21.4	50.51	27	87.2	19	60.00	36	42.3	21	10.31	18	77.0	17	20.20	15	37.3	19
31.4	50.24	32	89.1	16	59.64	44	44.4	17	10.13	22	78.7	15	20.05	18	39.2	15
Apr. 10.3	49.92	35	90.7	12	59.20	49	46.1	12	9.91	24	80.2	11	19.87	20	40.7	11
20.3	49.57	36	91.9	8	58.71	51	47.3	8	9.67	25	81.3	8	19.67	20	41.8	7
30.3	49.21	37	92.7	3	58.20	51	48.1	2	9.42	24	82.1	4	19.47	21	42.5	2
May 10.3	48.84	35	93.0	2	57.69	49	48.3	2	9.18	24	82.5	1	19.26	20	42.7	2
20.2	48.49	32	92.8	6	57.20	46	48.1	8	8.94	21	82.6	4	19.06	18	42.5	6
30.2	48.17	28	92.2	11	56.74	40	47.3	13	8.73	18	82.2	7	18.88	16	41.9	11
June 9.2	47.89	22	91.1	15	56.34	34	46.0	16	8.55	14	81.5	11	18.72	15	40.8	14
19.2	47.67	17	89.6	18	56.00	26	44.4	21	8.41	10	80.4	14	18.57	11	39.4	17
29.1	47.50	10	87.8	22	55.74	18	42.3	24	8.31	6	79.0	17	18.46	9	37.7	21
July 9.1	47.40	5	85.6	24	55.56	9	39.9	27	8.25	1	77.3	19	18.37	5	35.6	22
19.1	47.35	3	83.2	26	55.47	0	37.2	29	8.24	3	75.4	22	18.32	1	33.4	24
29.0	47.38	9	80.6	28	55.47	9	34.3	31	8.27	8	73.2	23	18.31	2	31.0	25
Aug. 8.0	47.47	17	77.8	29	55.56	18	31.2	31	8.35	13	70.9	24	18.33	7	28.5	24
18.0	47.64	22	74.9	30	55.74	27	28.1	32	8.48	18	68.5	25	18.40	10	26.1	23
28.0	47.86	30	71.9	30	56.01	36	24.9	32	8.66	22	66.0	26	18.50	15	23.8	21
Sept. 6.9	48.16	35	68.9	29	56.37	45	21.7	31	8.88	26	63.4	26	18.65	19	21.7	19
16.9	48.51	42	66.0	28	56.82	52	18.6	30	9.14	32	60.8	25	18.84	24	19.8	14
26.9	48.93	47	63.2	26	57.34	60	15.6	27	9.46	35	58.3	25	19.08	27	18.4	10
Oct. 6.9	49.40	53	60.6	24	57.94	67	12.9	25	9.81	40	55.8	23	19.35	31	17.4	5
16.8	49.93	57	58.2	22	58.61	73	10.4	22	10.21	43	53.5	22	19.66	34	16.9	0
26.8	50.50	61	56.0	18	59.34	77	8.2	17	10.64	46	51.3	19	20.00	37	16.9	7
Nov. 5.8	51.11	63	54.2	14	60.11	81	6.5	14	11.10	48	49.4	15	20.37	38	17.6	12
15.7	51.74	64	52.8	9	60.92	81	5.1	8	11.58	49	47.9	13	20.75	39	18.8	18
25.7	52.38	64	51.9	5	61.73	81	4.3	3	12.07	49	46.6	8	21.14	37	20.6	22
Dec. 5.7	53.02	62	51.4	0	62.54	78	4.0	2	12.56	47	45.8	4	21.51	36	22.8	27
15.7	53.64	57	51.4	5	63.32	73	4.2	7	13.03	45	45.4	0	21.87	33	25.5	30
25.6	54.21	52	51.9	10	64.05	65	4.9	13	13.48	40	45.4	4	22.20	28	28.5	33
35.6	54.73		52.9		64.70		6.2		13.88		45.8		22.48		31.8	
Sec δ, Tan δ	2.236		+2.000		2.953		+2.779		1.627		+1.283		1.307		−0.842	
Mean Place	$45^{s}.893$		79″.15		$54^{s}.099$		33″.07		$6^{s}.825$		71″.99		$18^{s}.604$		24″.31	
$D'_\psi a$, $D_\omega a$	+0.03		+0.10		+0.05		+0.15		+0.02		+0.07		−0.01		−0.04	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ξ Leonis.** Mag. 5.1				**10 Leonis Minoris.** Mag. 4.6				**ζ Chamæleontis.** Mag. 5.2				**ο Leonis.** Mag. 3.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 9 27		° ′ +11 40		h m 9 28		° ′ +36 46		h m 9 36		° ′ −80 33		h m 9 36		° ′ +10 16	
	s		″		s		″		s		″		s		″	
Jan. 0.6	20.10		52.2		59.46		42.6		30.33		0.5		35.06		62.8	
10.6	20.36	26	50.8	14	59.76	30	42.6	0	31.07	74	3.9	34	35.33	27	61.3	15
20.6	20.57	21	49.7	11	60.02	26	42.9	3	31.59	52	7.6	37	35.55	22	60.1	12
30.5	20.74	17	48.8	9	60.22	20	43.5	6	31.87	28	11.5	39	35.72	17	59.1	10
Feb. 9.5	20.86	12	48.1	7	60.36	14	44.4	9	31.91	4	15.5	40	35.85	13	58.3	8
19.5	20.92	6	47.7	4	60.44	8	45.5	11	31.72	19	19.4	39	35.92	7	57.8	5
Mar. 1.5	20.94	2	47.5	2	60.46	2	46.8	13	31.30	42	23.2	38	35.95	3	57.5	3
11.4	20.91	3	47.5	0	60.42	4	48.1	13	30.69	61	26.8	36	35.93	2	57.4	1
21.4	20.84	7	47.7	2	60.34	8	49.4	13	29.89	80	30.2	34	35.87	6	57.5	1
31.4	20.75	9	47.9	2	60.22	12	50.7	13	28.94	95	33.1	29	35.79	8	57.7	2
Apr. 10.3	20.64	11	48.3	4	60.07	15	51.8	11	27.85	109	35.7	26	35.68	11	58.0	3
20.3	20.51	13	48.7	4	59.91	16	52.8	10	26.66	119	37.8	21	35.55	13	58.4	4
30.3	20.38	13	49.2	5	59.73	18	53.6	8	25.41	125	39.5	17	35.43	12	58.8	4
May 10.3	20.25	13	49.6	4	59.56	17	54.1	5	24.11	130	40.6	11	35.30	13	59.3	5
20.2	20.13	12	50.0	4	59.41	15	54.3	2	22.81	130	41.2	6	35.18	12	59.8	5
30.2	20.03	10	50.5	5	59.27	14	54.3	0	21.52	129	41.2	0	35.08	10	60.2	4
June 9.2	19.94	9	50.9	4	59.15	12	54.1	2	20.28	124	40.7	5	34.99	9	60.7	5
19.2	19.88	6	51.2	3	59.06	9	53.6	5	19.12	116	39.7	10	34.93	6	61.1	4
29.1	19.85	3	51.5	3	59.00	6	52.9	7	18.07	105	38.2	15	34.88	5	61.4	3
July 9.1	19.83	2	51.8	3	58.98	2	51.9	10	17.16	91	36.2	20	34.86	2	61.7	3
19.1	19.85	2	51.9	1	58.98	0	50.7	12	16.42	74	33.9	23	34.87	1	61.9	2
29.0	19.89	4	52.0	1	59.03	5	49.4	13	15.86	56	31.2	27	34.90	3	62.1	2
Aug. 8.0	19.96	7	52.0	0	59.10	7	47.9	15	15.50	36	28.3	29	34.96	6	62.1	0
18.0	20.05	9	51.8	2	59.21	11	46.3	16	15.37	13	25.3	30	35.05	9	62.0	1
28.0	20.18	13	51.4	4	59.36	15	44.5	18	15.48	11	22.3	30	35.16	11	61.7	3
Sept. 6.9	20.33	15	51.0	4	59.54	18	42.6	19	15.81	33	19.3	30	35.30	14	61.3	4
16.9	20.51	18	50.3	7	59.76	22	40.7	19	16.37	56	16.5	28	35.48	18	60.7	6
26.9	20.73	22	49.4	9	60.01	25	38.7	20	17.15	78	14.1	24	35.68	20	59.8	9
Oct. 6.9	20.97	24	48.3	11	60.29	28	36.6	21	18.13	98	12.0	21	35.92	24	58.8	10
16.8	21.24	27	47.0	13	60.61	32	34.6	20	19.27	114	10.5	15	36.17	25	57.5	13
26.8	21.53	29	45.5	15	60.96	35	32.6	20	20.54	127	9.5	10	36.46	29	56.0	15
Nov. 5.8	21.84	31	43.9	16	61.33	37	30.8	18	21.90	136	9.2	3	36.77	31	54.4	16
15.7	22.17	33	42.1	18	61.72	39	29.0	18	23.30	140	9.5	3	37.10	33	52.6	18
25.7	22.51	34	40.3	18	62.12	40	27.5	15	24.68	138	10.5	10	37.44	34	50.7	19
Dec. 5.7	22.85	34	38.5	18	62.52	40	26.3	12	26.01	133	12.1	16	37.78	34	48.8	19
15.7	23.18	33	36.7	18	62.91	39	25.3	10	27.23	122	14.4	23	38.10	32	47.0	18
25.6	23.49	31	35.0	17	63.27	36	24.7	6	28.29	106	17.1	27	38.42	32	45.2	18
35.6	23.77	28	33.5	15	63.60	33	24.4	3	29.17	88	20.3	32	38.70	28	43.6	16
Sec δ, Tan δ	1.021		+0.207		1.248		+0.747		6.094		−6.012		1.016		+0.181	
Mean Place	$18^{s}.736$		$52''.43$		$57^{s}.597$		$48''.18$		$27^{s}.306$		$18''.17$		$33^{s}.755$		$63''.10$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		+0.01		+0.01		+0.04		−0.09		−0.32		0.00		+0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6	

APPARENT PLACES OF STARS, 1914.

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Antliæ.** Mag. 5.0				**ε Leonis.** Mag. 3.1				**υ Ursæ Majoris.** Mag. 3.9				**υ Argûs.** Mag. 3.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 40		−27 22		9 40		+24 9		9 44		+59 26		9 44		−64 40	
	s		″		s		″		s		″		s		″	
Jan. 0.6	23.10		22.0		59.87		70.7		56.11		27.8		58.49		6.4	
10.6	23.35	25	25.0	30	60.15	28	69.9	8	56.56	45	28.7	9	58.87	38	9.9	35
20.6	23.57	22	28.1	31	60.40	25	69.4	5	56.95	39	30.1	14	59.16	29	13.7	38
30.5	23.73	16	31.1	30	60.59	19	69.3	1	57.25	30	31.8	17	59.36	20	17.6	39
Feb. 9.5	23.84	11	34.0	29	60.73	14	69.4	1	57.46	21	33.8	20	59.47	11	21.5	39
19.5	23.89	5	36.6	26	60.81	8	69.7	3	57.58	12	36.1	23	59.47	0	25.4	39
Mar. 1.5	23.90	1	39.1	25	60.85	4	70.2	5	57.61	3	38.4	23	59.39	8	29.1	37
11.4	23.86	4	41.2	21	60.83	2	70.9	7	57.55	6	40.7	23	59.22	17	32.6	35
21.4	23.78	8	43.1	19	60.78	5	71.7	8	57.41	14	43.0	23	58.98	24	35.8	32
31.4	23.67	11	44.6	15	60.68	10	72.6	9	57.21	20	45.0	20	58.67	31	38.6	28
Apr. 10.4	23.53	14	45.7	11	60.56	12	73.4	8	56.96	25	46.7	17	58.32	35	41.0	24
20.3	23.39	14	46.5	8	60.43	13	74.2	8	56.67	29	48.1	14	57.92	40	42.9	19
30.3	23.23	16	47.0	5	60.29	14	74.8	6	56.36	31	49.1	10	57.51	41	44.4	15
May 10.3	23.07	16	47.1	1	60.15	14	75.4	6	56.05	31	49.7	6	57.08	43	45.3	9
20.2	22.92	15	46.8	3	60.02	13	75.9	5	55.74	31	49.8	1	56.64	44	45.7	4
30.2	22.78	14	46.3	5	59.91	11	76.1	2	55.46	28	49.5	3	56.22	42	45.6	1
June 9.2	22.66	12	45.4	9	59.81	10	76.3	2	55.21	25	48.7	8	55.82	40	44.9	7
19.2	22.55	11	44.2	12	59.73	8	76.3	0	55.00	21	47.5	12	55.45	37	43.8	11
29.1	22.47	8	42.7	15	59.68	5	76.1	2	54.83	17	46.0	15	55.11	34	42.2	16
July 9.1	22.41	6	41.1	16	59.66	2	75.8	3	54.72	11	44.1	19	54.83	28	40.1	21
19.1	22.38	3	39.3	18	59.66	0	75.3	5	54.66	6	41.9	22	54.61	22	37.8	23
29.1	22.38	0	37.4	19	59.69	3	74.6	7	54.65	1	39.5	24	54.45	16	35.1	27
Aug. 8.0	22.41	3	35.4	20	59.75	6	73.9	7	54.70	5	36.8	27	54.36	9	32.2	29
18.0	22.47	6	33.5	19	59.84	9	72.9	10	54.81	11	34.0	28	54.35	1	29.3	29
28.0	22.56	9	31.7	18	59.96	12	71.8	11	54.97	16	31.1	29	54.43	8	26.3	30
Sept. 6.9	22.69	13	30.1	16	60.10	14	70.6	12	55.19	22	28.2	29	54.59	16	23.5	28
16.9	22.86	17	28.8	13	60.28	18	69.2	14	55.47	28	25.3	29	54.83	24	20.8	27
26.9	23.06	20	27.8	10	60.50	22	67.7	15	55.81	34	22.4	29	55.16	33	18.5	23
Oct. 6.9	23.30	24	27.2	6	60.74	24	66.0	17	56.20	39	19.6	28	55.57	41	16.7	18
16.8	23.57	27	27.0	2	61.02	28	64.2	18	56.64	44	17.0	26	56.04	47	15.3	14
26.8	23.88	31	27.4	4	61.33	31	62.4	18	57.12	48	14.6	24	56.57	53	14.6	7
Nov. 5.8	24.20	32	28.2	8	61.65	32	60.6	18	57.65	53	12.5	21	57.14	57	14.5	1
15.8	24.55	35	29.6	14	62.00	35	58.7	19	58.20	55	10.8	17	57.74	60	15.0	5
25.7	24.90	35	31.4	18	62.36	36	56.9	18	58.77	57	9.5	13	58.35	61	16.2	12
Dec. 5.7	25.25	35	33.6	22	62.72	36	55.2	17	59.35	58	8.6	9	58.94	59	18.1	19
15.7	25.59	34	36.1	25	63.08	36	53.8	14	59.91	56	8.2	4	59.49	55	20.5	24
25.6	25.90	31	38.9	28	63.41	33	52.5	13	60.44	53	8.3	1	60.00	51	23.4	29
35.6	26.19	29	41.9	30	63.72	31	51.6	9	60.93	49	8.9	6	60.43	43	26.7	33
Sec δ, Tan δ	1.126		−0.518		1.096		+0.449		1.967		+1.694		2.338		−2.113	
Mean Place	22ˢ.061		31″.02		58ˢ.360		74″.51		53ˢ.159		37″.99		57ˢ.187		22″.66	
D′ψ α, Dω α	−0.01		−0.03		+0.01		+0.02		+0.02		+0.09		−0.03		−0.12	
Dψ δ, Dω δ	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**6 Sextantis.** Mag. 6.0				**μ Leonis.** Mag. 4.1				**Groombridge 1586.** Mag. 6.0				**19 Leonis Minoris.** Mag. 5.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 9 46		° ′ − 3 50		h m 9 47		° ′ +26 24		h m 9 50		° ′ +73 16		h m 9 52		° ′ +41 27	
	s		″		s		″		s		″		s		″	
Jan. 0.6	55.19		20.3		54.02		40.4		48.44		68.9		27.24		48.7	
10.6	55.45	26	22.4	21	54.32	30	39.7	7	49.18	74	70.3	14	27.59	35	48.7	0
20.6	55.67	22	24.5	21	54.57	25	39.3	4	49.80	62	72.2	19	27.88	29	49.1	4
30.6	55.84	17	26.4	19	54.78	21	39.2	1	50.28	48	74.5	23	28.12	24	49.8	7
Feb. 9.5	55.97	13	28.0	16	54.93	15	39.4	2	50.62	34	77.0	25	28.30	18	50.9	11
19.5	56.05	8	29.4	14	55.02	9	39.9	5	50.79	17	79.8	28	28.40	10	52.2	13
Mar. 1.5	56.08	3	30.6	12	55.06	4	40.5	6	50.81	2	82.6	28	28.45	5	53.8	16
11.4	56.06	2	31.5	9	55.05	1	41.4	9	50.68	13	85.3	27	28.44	1	55.4	16
21.4	56.01	5	32.2	7	55.00	5	42.3	9	50.41	27	87.9	26	28.37	7	57.0	16
31.4	55.93	8	32.6	4	54.91	9	43.2	9	50.02	39	90.2	23	28.26	11	58.6	16
Apr. 10.4	55.83	10	32.8	2	54.79	12	44.2	10	49.54	48	92.2	20	28.12	14	60.0	14
20.3	55.72	11	32.9	1	54.66	13	45.0	8	48.98	56	93.7	15	27.95	17	61.2	12
30.3	55.59	13	32.8	1	54.52	14	45.8	8	48.38	60	94.7	10	27.77	18	62.2	10
May 10.3	55.47	12	32.5	3	54.37	15	46.4	6	47.77	61	95.2	5	27.58	19	62.9	7
20.2	55.35	12	32.0	5	54.24	13	46.9	5	47.16	61	95.2	0	27.40	18	63.3	4
30.2	55.25	10	31.5	5	54.12	12	47.2	3	46.58	58	94.6	6	27.24	16	63.4	1
June 9.2	55.16	9	30.8	7	54.01	11	47.3	1	46.05	53	93.6	10	27.10	14	63.2	2
19.2	55.08	8	30.1	7	53.93	8	47.2	1	45.58	47	92.1	15	26.98	12	62.6	6
29.1	55.03	5	29.2	9	53.87	6	47.0	2	45.19	39	90.1	20	26.89	9	61.8	8
July 9.1	55.00	3	28.4	8	53.84	3	46.5	5	44.89	30	87.7	24	26.83	6	60.7	11
19.1	54.99	1	27.5	9	53.83	1	45.9	6	44.69	20	85.0	27	26.81	2	59.4	13
29.1	55.01	2	26.6	9	53.85	2	45.2	7	44.59	10	82.1	29	26.82	1	57.8	16
Aug. 8.0	55.05	4	25.8	8	53.91	6	44.3	9	44.60	1	78.9	32	26.86	4	56.1	17
18.0	55.12	7	25.1	7	53.99	8	43.2	11	44.71	11	75.6	33	26.95	9	54.2	19
28.0	55.22	10	24.6	5	54.10	11	41.9	13	44.93	22	72.2	34	27.07	12	52.1	21
Sept. 6.9	55.34	12	24.2	4	54.24	14	40.5	14	45.26	33	68.8	34	27.23	16	49.9	22
16.9	55.50	16	24.1	1	54.42	18	39.0	15	45.69	43	65.5	33	27.43	20	47.6	23
26.9	55.69	19	24.2	1	54.63	21	37.4	16	46.22	53	62.3	32	27.66	23	45.3	23
Oct. 6.9	55.91	22	24.7	5	54.88	25	35.6	18	46.84	62	59.2	31	27.94	28	42.9	24
16.8	56.16	25	25.5	8	55.15	27	33.7	19	47.55	71	56.4	28	28.25	31	40.6	23
26.8	56.44	28	26.6	11	55.45	30	31.8	19	48.34	79	54.0	24	28.60	35	38.3	23
Nov. 5.8	56.74	30	27.9	13	55.78	33	29.8	20	49.19	85	51.9	21	28.98	38	36.2	21
15.8	57.06	32	29.6	17	56.13	35	28.0	18	50.09	90	50.2	17	29.38	40	34.3	19
25.7	57.39	33	31.5	19	56.50	37	26.1	19	51.02	93	49.1	11	29.79	41	32.6	17
Dec. 5.7	57.72	33	33.6	21	56.86	36	24.4	17	51.96	94	48.5	6	30.21	42	31.2	14
15.7	58.05	33	35.8	22	57.22	36	23.0	14	52.87	91	48.4	1	30.63	42	30.2	10
25.6	58.36	31	38.0	22	57.57	35	21.8	12	53.74	87	49.0	6	31.03	40	29.5	7
35.6	58.64	28	40.3	23	57.88	31	20.9	9	54.53	79	50.0	10	31.39	36	29.2	3
Sec δ, Tan δ	1.002		−0.067		1.117		+0.497		3.477		+3.330		1.334		+0.884	
Mean Place	$54^{s}.063$		$23''.22$		$52^{s}.504$		$45''.11$		$43^{s}.307$		$80''.77$		$25^{s}.343$		$56''.78$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		0.00		+0.01		+0.03		+0.05		+0.19		+0.01		+0.05	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		+0.5		−0.3		+0.5		−0.3		+0.5		−0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	φ Argûs. Mag. 3.7				π Leonis. Mag. 4.9				η Leonis. Mag. 3.6				α Leonis. Mag. 1.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 53		−54 9		9 55		+ 8 27		10 2		+17 10		10 3		+12 22	
	s		″		s		″		s		″		s		″	
Jan. 0.6	51.48		15.0		41.41		25.6		39.97		53.7		48.84		74.5	
10.6	51.81	33	18.5	35	41.68	27	24.0	16	40.26	29	52.5	12	49.13	29	73.0	15
20.6	52.07	26	22.1	36	41.92	24	22.6	14	40.51	25	51.5	10	49.38	25	71.8	12
30.6	52.26	19	25.9	38	42.11	19	21.4	12	40.72	21	50.8	7	49.58	20	70.8	10
Feb. 9.5	52.39	13	29.7	38	42.25	14	20.5	9	40.88	16	50.4	4	49.73	15	70.1	7
19.5	52.43	4	33.4	37	42.35	10	19.8	7	40.98	10	50.2	2	49.83	10	69.6	5
Mar. 1.5	52.41	2	36.9	35	42.39	4	19.3	5	41.03	5	50.3	1	49.88	5	69.4	2
11.4	52.33	8	40.2	33	42.39	0	19.1	2	41.04	1	50.6	3	49.89	1	69.5	1
21.4	52.19	14	43.1	29	42.35	4	19.1	0	41.00	4	51.1	5	49.86	3	69.7	2
31.4	52.00	19	45.8	27	42.28	7	19.3	2	40.93	7	51.7	6	49.79	7	70.0	3
Apr. 10.4	51.77	23	48.0	22	42.18	10	19.6	3	40.84	9	52.3	6	49.70	9	70.5	5
20.3	51.52	25	49.7	17	42.07	11	19.9	3	40.73	11	53.0	7	49.59	11	71.0	5
30.3	51.24	28	51.0	13	41.95	12	20.4	5	40.60	13	53.6	6	49.47	12	71.5	5
May 10.3	50.96	28	51.8	8	41.83	12	20.8	4	40.48	12	54.2	6	49.35	12	72.1	6
20.3	50.68	28	52.1	3	41.72	11	21.3	5	40.36	12	54.8	6	49.24	11	72.6	5
30.2	50.40	28	52.0	1	41.61	11	21.8	5	40.25	11	55.2	4	49.13	11	73.1	5
June 9.2	50.14	26	51.3	7	41.52	9	22.3	5	40.15	10	55.6	4	49.03	10	73.5	4
19.2	49.90	24	50.2	11	41.45	7	22.8	5	40.07	8	55.8	2	48.95	8	73.9	4
29.1	49.69	21	48.6	16	41.39	6	23.2	4	40.01	6	56.0	2	48.90	5	74.2	3
July 9.1	49.51	18	46.7	19	41.36	3	23.6	4	39.97	4	56.0	0	48.86	4	74.4	2
19.1	49.37	14	44.4	23	41.35	1	23.8	2	39.96	1	55.9	1	48.84	2	74.5	1
29.1	49.28	9	41.9	25	41.36	1	24.1	3	39.97	1	55.6	3	48.85	1	74.5	0
Aug. 8.0	49.23	5	39.2	27	41.40	4	24.2	1	40.00	3	55.2	4	48.88	3	74.4	1
18.0	49.24	1	36.4	28	41.47	7	24.1	1	40.07	7	54.6	6	48.94	6	74.1	3
28.0	49.31	7	33.7	27	41.56	9	23.9	2	40.16	9	53.9	7	49.03	9	73.7	4
Sept. 7.0	49.44	13	31.1	26	41.69	13	23.6	3	40.28	12	53.0	9	49.14	11	73.0	7
16.9	49.62	18	28.7	24	41.84	15	23.0	6	40.43	15	52.0	10	49.29	15	72.2	8
26.9	49.87	25	26.6	21	42.03	19	22.2	8	40.62	19	50.7	13	49.47	18	71.2	10
Oct. 6.9	50.18	31	25.0	16	42.24	21	21.2	10	40.83	21	49.2	15	49.68	21	70.0	12
16.8	50.53	35	23.8	12	42.49	25	19.9	13	41.08	25	47.6	16	49.93	25	68.5	15
26.8	50.94	41	23.2	6	42.77	28	18.4	15	41.36	28	45.9	17	50.20	27	66.9	16
Nov. 5.8	51.38	44	23.3	1	43.07	30	16.8	16	41.67	31	44.0	19	50.50	30	65.2	17
15.8	51.84	46	23.9	6	43.39	32	15.0	18	42.00	33	42.0	20	50.83	33	63.3	19
25.7	52.31	47	25.2	13	43.72	33	13.0	20	42.34	34	40.1	19	51.16	33	61.3	20
Dec. 5.7	52.78	47	27.1	19	44.06	34	11.0	20	42.69	35	38.2	19	51.51	35	59.3	20
15.7	53.23	45	29.6	25	44.40	34	9.1	19	43.04	35	36.4	18	51.85	34	57.4	19
25.7	53.65	42	32.5	29	44.72	32	7.2	19	43.37	33	34.8	16	52.18	33	55.6	18
35.6	54.02	37	35.7	32	45.01	29	5.4	18	43.68	31	33.4	14	52.48	30	54.0	16
Sec δ, Tan δ	1.708		−1.384		1.011		+0.149		1.047		+0.309		1.024		+0.220	
Mean Place	$50^{s}.455$		$29''.79$		$40^{s}.203$		$26''.29$		$38^{s}.678$		$56''.99$		$47^{s}.626$		$76''.58$	
$D'_{\psi}a$, $D_{\omega}a$	−0.02		−0.08		0.00		+0.01		0.00		+0.02		0.00		+0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		+0.5		−0.3		+0.5		−0.3		+0.5		−0.3		+0.5	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**λ Hydræ.** Mag. 3.8				**q Velorum.** Mag. 4.1				**32 Ursæ Majoris.** Mag. 5.7				**ζ Leonis.** Mag. 3.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 10 6		° ′ −11 55		h m 10 11		° ′ −41 41		h m 10 11		° ′ +65 31		h m 10 11		° ′ +23 50	
	s		″		s		″		s		″		s		″	
Jan. 0.6	24.70		38.1		8.18		31.6		51.65		63.4		55.97		41.2	
10.6	24.98	28	40.6	25	8.49	31	34.8	32	52.22	57	64.2	8	56.28	31	40.2	10
20.6	25.21	23	43.1	25	8.75	26	38.2	34	52.71	49	65.6	14	56.55	27	39.6	6
30.6	25.40	19	45.4	23	8.96	21	41.6	34	53.11	40	67.4	18	56.77	22	39.2	4
Feb. 9.5	25.54	14	47.5	21	9.10	14	45.1	35	53.41	30	69.6	22	56.94	17	39.2	0
19.5	25.64	10	49.4	19	9.19	9	48.4	33	53.60	19	72.0	24	57.06	12	39.5	3
Mar. 1.5	25.68	4	51.1	17	9.22	3	51.6	32	53.68	8	74.6	26	57.13	7	40.0	5
11.5	25.68	0	52.5	14	9.19	3	54.5	29	53.66	2	77.2	26	57.14	1	40.7	7
21.4	25.65	3	53.7	12	9.12	7	57.1	26	53.53	13	79.7	25	57.11	3	41.5	8
31.4	25.58	7	54.5	8	9.01	11	59.4	23	53.31	22	82.0	23	57.05	6	42.4	9
Apr. 10.4	25.49	9	55.2	7	8.87	14	61.3	19	53.03	28	84.1	21	56.95	10	43.4	10
20.3	25.38	11	55.6	4	8.70	17	62.9	16	52.69	34	85.8	17	56.84	11	44.3	9
30.3	25.26	12	55.7	1	8.52	18	64.0	11	52.32	37	87.1	13	56.71	13	45.1	8
May 10.3	25.14	12	55.6	1	8.33	19	64.6	6	51.92	40	88.0	9	56.58	13	45.8	7
20.3	25.02	12	55.3	3	8.14	19	64.9	3	51.52	40	88.4	4	56.45	13	46.4	6
30.2	24.90	12	54.8	5	7.95	19	64.7	2	51.14	38	88.2	2	56.33	12	46.8	4
June 9.2	24.80	10	54.1	7	7.78	17	64.1	6	50.79	35	87.6	6	56.22	11	47.1	3
19.2	24.71	9	53.3	8	7.61	17	63.1	10	50.47	32	86.5	11	56.13	9	47.2	1
29.2	24.64	7	52.3	10	7.47	14	61.8	13	50.20	27	85.0	15	56.06	7	47.2	0
July 9.1	24.59	5	51.2	11	7.35	12	60.1	17	49.98	22	83.0	20	56.02	4	46.9	3
19.1	24.56	3	50.1	11	7.25	10	58.2	19	49.83	15	80.7	23	55.99	3	46.5	4
29.1	24.56	0	48.9	12	7.19	6	56.0	22	49.73	10	78.1	26	55.99	0	45.9	6
Aug. 8.0	24.58	2	47.7	12	7.16	3	53.7	23	49.71	2	75.3	28	56.02	3	45.1	8
18.0	24.62	4	46.6	11	7.17	1	51.3	24	49.76	5	72.2	31	56.07	5	44.1	10
28.0	24.70	8	45.7	9	7.22	5	48.9	24	49.88	12	69.1	31	56.16	9	43.0	11
Sept. 7.0	24.80	10	44.9	8	7.32	10	46.7	22	50.07	19	65.8	33	56.27	11	41.7	13
16.9	24.94	14	44.3	6	7.47	15	44.7	20	50.33	26	62.5	33	56.42	15	40.2	15
26.9	25.11	17	44.0	3	7.66	19	43.0	17	50.67	34	59.3	32	56.60	18	38.6	16
Oct. 6.9	25.32	21	44.1	1	7.90	24	41.6	14	51.08	41	56.2	31	56.82	22	36.8	18
16.9	25.56	24	44.5	4	8.18	28	40.8	8	51.55	47	53.2	30	57.07	25	34.9	19
26.8	25.83	27	45.3	8	8.50	32	40.4	4	52.09	54	50.5	27	57.35	28	32.9	20
Nov. 5.8	26.12	29	46.4	11	8.86	36	40.7	3	52.68	59	48.1	24	57.66	31	30.8	21
15.8	26.44	32	48.0	16	9.25	39	41.5	8	53.31	63	46.1	20	58.00	34	28.8	20
25.7	26.78	34	49.8	18	9.64	39	42.8	13	53.97	66	44.5	16	58.36	36	26.8	20
Dec. 5.7	27.11	33	51.9	21	10.04	40	44.7	19	54.65	68	43.4	11	58.72	36	24.9	19
15.7	27.44	33	54.2	23	10.43	39	47.1	24	55.32	67	42.9	5	59.08	36	23.2	17
25.7	27.76	32	56.6	24	10.80	37	49.8	27	55.97	65	42.8	1	59.43	35	21.8	14
35.6	28.06	30	59.2	26	11.14	34	52.9	31	56.58	61	43.4	6	59.75	32	20.6	12
Sec δ, Tan δ	1.022		−0.211		1.339		−0.891		2.415		+2.198		1.093		+0.442	
Mean Place	23ˢ.730		42″.72		7ˢ.347		43″.90		48ˢ.259		76″.45		54ˢ.612		46″.74	
$D'_\psi\alpha$, $D_\omega\alpha$	0.00		−0.01		−0.01		−0.05		+0.03		+0.13		+0.01		+0.03	
$D_\psi\delta$, $D_\omega\delta$	−0.3		+0.5		−0.4		+0.5		−0.4		+0.5		−0.4		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Ursæ Majoris. Mag. 3.5				γ Leonis *pr.* Mag. 2.6				μ Ursæ Majoris. Mag. 3.2				30 H. Ursæ Majoris. Mag. 4.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 10 11 s		° ′ +43 20 ″		h m 10 15 s		° ′ +20 16 ″		h m 10 17 s		° ′ +41 55 ″		h m 10 17 s		° ′ +65 59 ″	
Jan. 0.7	56.86		29.8		15.29		32.4		14.47		46.9		60.46		52.9	
10.6	57.23	37	29.7	1	15.59	30	31.2	12	14.84	37	46.7	2	61.05	59	53.7	8
20.6	57.55	32	30.0	3	15.86	27	30.3	9	15.16	32	46.9	2	61.56	51	55.1	14
30.6	57.82	27	30.8	8	16.08	22	29.8	5	15.42	26	47.6	7	61.98	42	56.8	17
Feb. 9.5	58.02	20	31.9	11	16.25	17	29.5	3	15.63	21	48.6	10	62.30	32	59.0	22
19.5	58.15	13	33.3	14	16.37	12	29.5	0	15.77	14	49.9	13	62.51	21	61.4	24
Mar. 1.5	58.22	7	34.9	16	16.44	7	29.8	3	15.84	7	51.4	15	62.60	9	64.0	26
11.5	58.23	1	36.6	17	16.46	2	30.3	5	15.86	2	53.1	17	62.58	2	66.6	26
21.4	58.18	5	38.4	18	16.43	3	30.9	6	15.82	4	54.8	17	62.47	11	69.2	26
31.4	58.09	9	40.1	17	16.37	6	31.7	8	15.74	8	56.5	17	62.26	21	71.6	24
Apr. 10.4	57.95	14	41.7	16	16.29	8	32.5	8	15.61	13	58.1	16	61.98	28	73.8	22
20.4	57.79	16	43.1	14	16.18	11	33.3	8	15.46	15	59.5	14	61.64	34	75.5	17
30.3	57.62	17	44.3	12	16.06	12	34.0	7	15.29	17	60.7	12	61.26	38	76.9	14
May 10.3	57.43	19	45.2	9	15.94	12	34.7	7	15.11	18	61.6	9	60.86	40	77.8	9
20.3	57.24	19	45.7	5	15.81	13	35.3	6	14.93	18	62.2	6	60.46	40	78.2	4
30.2	57.07	17	45.9	2	15.70	11	35.8	5	14.76	17	62.5	3	60.06	40	78.2	0
June 9.2	56.91	16	45.8	1	15.60	10	36.1	3	14.60	16	62.5	0	59.69	37	77.6	6
19.2	56.77	14	45.4	4	15.51	9	36.3	2	14.47	13	62.2	3	59.36	33	76.5	11
29.2	56.66	11	44.6	8	15.44	7	36.4	1	14.36	11	61.5	7	59.08	28	75.1	14
July 9.1	56.58	8	43.6	10	15.39	5	36.3	1	14.28	8	60.5	10	58.85	23	73.2	19
19.1	56.53	5	42.2	14	15.37	2	36.0	3	14.23	5	59.2	13	58.67	18	70.9	23
29.1	56.51	2	40.6	16	15.36	1	35.6	4	14.21	2	57.7	15	58.57	10	68.3	26
Aug. 8.0	56.53	2	38.8	18	15.39	3	35.0	6	14.22	1	56.0	17	58.53	4	65.5	28
18.0	56.59	6	36.8	20	15.44	5	34.3	7	14.27	5	54.0	20	58.56	3	62.4	31
28.0	56.69	10	34.5	23	15.52	8	33.3	10	14.36	9	51.9	21	58.66	10	59.2	32
Sept. 7.0	56.82	13	32.2	23	15.63	11	32.2	11	14.48	12	49.6	23	58.84	18	55.9	33
16.9	56.99	17	29.7	25	15.77	14	30.9	13	14.64	16	47.2	24	59.09	25	52.6	33
26.9	57.21	22	27.2	25	15.95	18	29.5	14	14.85	21	44.7	25	59.42	33	49.3	33
Oct. 6.9	57.47	26	24.6	26	16.16	21	27.8	17	15.10	25	42.1	26	59.81	39	46.1	32
16.9	57.76	29	22.1	25	16.40	24	26.0	18	15.38	28	39.6	25	60.28	47	43.1	30
26.8	58.10	34	19.6	25	16.68	28	24.1	19	15.71	33	37.1	25	60.81	53	40.3	28
Nov. 5.8	58.48	38	17.3	23	16.98	30	22.1	20	16.07	36	34.8	23	61.40	59	37.9	24
15.8	58.88	40	15.2	21	17.31	33	20.1	20	16.46	39	32.6	22	62.04	64	35.8	21
25.7	59.30	42	13.3	19	17.66	35	18.1	20	16.87	41	30.6	20	62.71	67	34.1	17
Dec. 5.7	59.73	43	11.7	16	18.01	35	16.1	20	17.30	43	29.0	16	63.39	68	32.9	12
15.7	60.16	43	10.6	11	18.37	36	14.3	18	17.72	42	27.7	13	64.08	69	32.3	6
25.7	60.57	41	9.8	8	18.71	34	12.7	16	18.13	41	26.8	9	64.74	66	32.2	1
35.6	60.96	39	9.4	4	19.04	33	11.4	13	18.52	39	26.3	5	65.36	62	32.7	5
Sec δ, Tan δ	1.375		+0.944		1.066		+0.369		1.344		+0.898		2.459		+2.246	
Mean Place	55^{s}.004		39″.66		14^{s}.004		37″.13		12^{s}.689		56″.86		57^{s}.078		66″.57	
D′ψ a, Dω a	+0.01		+0.06		0.00		+0.02		+0.01		+0.05		+0.03		+0.14	
Dψ δ, Dω δ	−0.4		+0.5		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Hydræ. Mag. 4.1				31 Leonis Minoris. Mag. 4.4				α Antliæ. Mag. 4.4				36 Ursæ Majoris. Mag. 4.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 10 21 s		° ′ −16 23 ″		h m 10 22 s		° ′ +37 8 ″		h m 10 23 s		° ′ −30 37 ″		h m 10 25 s		° ′ +56 24 ″	
Jan. 0.7	56.70		43.2		56.54		44.2		13.67		38.1		10.40		65.9	
10.6	56.98	28	45.8	26	56.89	35	43.8	4	13.97	30	41.1	30	10.87	47	66.2	3
20.6	57.23	25	48.4	26	57.20	31	43.7	1	14.23	26	44.2	31	11.28	41	67.1	9
30.6	57.44	21	51.0	26	57.46	26	44.1	4	14.44	21	47.3	31	11.62	34	68.4	13
Feb. 9.5	57.60	16	53.3	23	57.66	20	44.8	7	14.60	16	50.3	30	11.88	26	70.1	17
19.5	57.70	10	55.5	22	57.80	14	45.8	10	14.70	10	53.2	29	12.06	18	72.1	20
Mar. 1.5	57.76	6	57.5	20	57.88	8	47.0	12	14.76	6	55.9	27	12.16	10	74.3	22
11.5	57.78	2	59.2	17	57.91	3	48.5	15	14.76	0	58.4	25	12.18	2	76.6	23
21.4	57.76	2	60.6	14	57.88	3	50.0	15	14.73	3	60.6	22	12.12	6	79.0	24
31.4	57.70	6	61.8	12	57.81	7	51.5	15	14.66	7	62.4	18	11.99	13	81.2	22
Apr. 10.4	57.62	8	62.7	9	57.70	11	53.0	15	14.56	10	64.0	16	11.81	18	83.2	20
20.4	57.52	10	63.3	6	57.57	13	54.3	13	14.43	13	65.2	12	11.59	22	84.9	17
30.3	57.40	12	63.6	3	57.42	15	55.5	12	14.30	13	66.0	8	11.34	25	86.4	15
May 10.3	57.28	12	63.7	1	57.26	16	56.4	9	14.15	15	66.5	5	11.07	27	87.4	10
20.3	57.16	12	63.5	2	57.10	16	57.1	7	14.00	15	66.6	1	10.80	27	88.0	6
30.2	57.04	12	63.1	4	56.95	15	57.5	4	13.86	14	66.4	2	10.53	27	88.1	1
June 9.2	56.93	11	62.5	6	56.81	14	57.6	1	13.72	14	65.8	6	10.29	24	87.9	2
19.2	56.84	9	61.7	8	56.68	13	57.4	2	13.60	12	64.9	9	10.06	23	87.2	7
29.2	56.75	9	60.7	10	56.58	10	56.9	5	13.48	12	63.7	12	9.87	19	86.1	11
July 9.1	56.69	6	59.5	12	56.51	7	56.2	7	13.39	9	62.3	14	9.72	15	84.6	15
19.1	56.64	5	58.3	12	56.46	5	55.1	11	13.32	7	60.6	17	9.61	11	82.7	19
29.1	56.62	2	57.0	13	56.44	2	53.9	12	13.28	4	58.8	18	9.54	7	80.6	21
Aug. 8.1	56.62	0	55.6	14	56.45	1	52.4	15	13.26	2	56.9	19	9.52	2	78.1	25
18.0	56.65	3	54.3	13	56.49	4	50.7	17	13.27	1	55.0	19	9.55	3	75.5	26
28.0	56.71	6	53.2	11	56.57	8	48.8	19	13.32	5	53.1	19	9.63	8	72.6	29
Sept. 7.0	56.80	9	52.1	11	56.68	11	46.7	21	13.41	9	51.4	17	9.76	13	69.7	29
16.9	56.92	12	51.3	8	56.83	15	44.5	22	13.53	12	49.8	16	9.94	18	66.6	31
26.9	57.08	16	50.8	5	57.02	19	42.2	23	13.70	17	48.6	12	10.18	24	63.6	30
Oct. 6.9	57.27	19	50.6	2	57.24	22	39.8	24	13.90	20	47.7	9	10.48	30	60.5	31
16.9	57.50	23	50.8	2	57.51	27	37.4	24	14.15	25	47.2	5	10.83	35	57.6	29
26.8	57.77	27	51.4	6	57.82	31	34.9	25	14.44	29	47.2	0	11.23	40	54.8	28
Nov. 5.8	58.06	29	52.3	9	58.16	34	32.6	23	14.76	32	47.7	5	11.68	45	52.3	25
15.8	58.38	32	53.7	14	58.52	36	30.4	22	15.10	34	48.7	10	12.17	49	50.0	23
25.8	58.72	34	55.4	17	58.91	39	28.3	21	15.46	36	50.2	15	12.68	51	48.1	19
Dec. 5.7	59.06	34	57.5	21	59.31	40	26.6	17	15.83	37	52.1	19	13.21	53	46.6	15
15.7	59.40	34	59.8	23	59.71	40	25.1	15	16.19	36	54.4	23	13.74	53	45.6	10
25.7	59.73	33	62.3	25	60.11	40	24.0	11	16.53	34	57.0	26	14.26	52	45.2	4
35.6	60.03	30	64.9	26	60.47	36	23.3	7	16.86	33	59.9	29	14.75	49	45.2	0
Sec δ, Tan δ	1.042		−0.294		1.255		+0.758		1.162		−0.592		1.808		+1.506	
Mean Place	$55^{s}.835$		48″.71		$54^{s}.941$		53″.58		$12^{s}.887$		47″.62		$7^{s}.991$		78″.94	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.02		+0.01		+0.05		−0.01		−0.04		+0.02		+0.09	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	9 H. Draconis. Mag. 5.0				ρ Leonis. Mag. 3.8				33 Sextantis. Mag. 6.4				41 Leonis Minoris. Mag. 5.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 27		+76 8		10 28		+ 9 44		10 37		− 1 17		10 38		+23 37	
	s		″		s		″		s		″		s		″	
Jan. 0.7	54.74		68.2		18.14		55.9		2.59		19.7		45.79		73.3	
10.6	55.68	94	69.3	11	18.44	30	54.2	17	2.88	29	21.8	21	46.11	32	72.2	11
20.6	56.50	82	70.9	16	18.70	26	52.7	15	3.14	26	23.8	20	46.40	29	71.4	8
30.6	57.18	68	72.9	20	18.92	22	51.5	12	3.36	22	25.6	18	46.65	25	70.9	5
Feb. 9.6	57.69	51	75.4	25	19.10	18	50.6	9	3.54	18	27.2	16	46.84	19	70.7	2
		34		27		12		7		13		14		15		2
19.5	58.03		78.1		19.22		49.9		3.67		28.6		46.99		70.9	
Mar. 1.5	58.18	15	81.0	29	19.30	8	49.6	3	3.75	8	29.7	11	47.08	9	71.4	5
11.5	58.14	4	83.9	29	19.33	3	49.4	2	3.79	4	30.5	8	47.13	5	72.0	6
21.4	57.93	21	86.7	28	19.32	1	49.5	1	3.79	0	31.1	6	47.13	0	72.9	9
31.4	57.57	36	89.3	26	19.28	4	49.7	2	3.75	4	31.4	3	47.09	4	73.9	10
		50		23		7		4		6		2		7		10
Apr. 10.4	57.07		91.6		19.21		50.1		3.69		31.6		47.02		74.9	
20.4	56.46	61	93.6	20	19.12	9	50.5	4	3.60	9	31.6	0	46.92	10	75.9	10
30.3	55.78	68	95.0	14	19.01	11	51.0	5	3.51	9	31.4	2	46.80	12	76.9	10
May 10.3	55.05	73	96.0	10	18.90	11	51.6	6	3.40	11	31.2	2	46.68	12	77.7	8
20.3	54.29	76	96.4	4	18.79	11	52.2	6	3.30	10	30.8	4	46.56	12	78.4	7
		74		2		10		5		11		5		12		6
30.3	53.55		96.2		18.69		52.7		3.19		30.3		46.44		79.0	
June 9.2	52.83	72	95.5	7	18.59	10	53.2	5	3.10	9	29.7	6	46.33	11	79.4	4
19.2	52.17	66	94.3	12	18.50	9	53.7	5	3.01	9	29.1	6	46.23	10	79.6	2
29.2	51.58	59	92.6	17	18.43	7	54.0	3	2.93	8	28.4	7	46.14	9	79.7	1
July 9.1	51.08	50	90.5	21	18.38	5	54.4	4	2.87	6	27.8	6	46.07	7	79.5	2
		40		25		4		2		4		7		4		3
19.1	50.68		88.0		18.34		54.6		2.83		27.1		46.03		79.2	
29.1	50.40	28	85.1	29	18.33	1	54.7	1	2.81	2	26.5	6	46.00	3	78.6	6
Aug. 8.1	50.23	17	81.9	32	18.34	1	54.7	0	2.81	0	25.9	6	46.00	0	77.9	7
18.0	50.18	5	78.6	33	18.38	4	54.6	1	2.83	2	25.4	5	46.02	2	76.9	10
28.0	50.26	8	75.0	36	18.44	6	54.3	3	2.88	5	25.1	3	46.08	6	75.8	11
		21		36		9		5		8		1		8		14
Sept. 7.0	50.47		71.4		18.53		53.8		2.96		25.0		46.16		74.4	
17.0	50.81	34	67.8	36	18.65	12	53.0	8	3.07	11	25.0	0	46.28	12	72.9	15
26.9	51.28	47	64.3	35	18.81	16	52.1	9	3.21	14	25.3	3	46.44	16	71.2	17
Oct. 6.9	51.87	59	60.9	34	19.00	19	51.0	11	3.39	18	25.9	6	46.63	19	69.3	19
16.9	52.58	71	57.7	32	19.22	22	49.6	14	3.60	21	26.8	9	46.85	22	67.3	20
		82		29		26		16		25		12		27		21
26.8	53.40		54.8		19.48		48.0		3.85		28.0		47.12		65.2	
Nov. 5.8	54.31	91	52.3	25	19.76	28	46.2	18	4.13	28	29.4	14	47.41	29	63.0	22
15.8	55.30	99	50.1	22	20.08	32	44.3	19	4.44	31	31.1	17	47.73	32	60.8	22
25.8	56.35	105	48.5	16	20.41	33	42.3	20	4.76	32	33.0	19	48.08	35	58.7	21
Dec. 5.7	57.43	108	47.4	11	20.75	34	40.2	21	5.10	34	35.1	21	48.44	36	56.6	21
		108		5		34		20		34		22		36		19
15.7	58.51		46.9		21.09		38.2		5.44		37.3		48.80		54.7	
25.7	59.57	106	47.0	1	21.42	33	36.2	20	5.77	33	39.5	22	49.16	36	53.1	16
35.7	60.56	99	47.7	7	21.74	32	34.4	18	6.08	31	41.7	22	49.50	34	51.7	14
Sec δ, Tan δ	4.178		+4.057		1.015		+0.172		1.000		−0.023		1.092		+0.438	
Mean Place	49ˢ.200		83″.42		17ˢ.074		58″.34		1ˢ.681		20″.22		44ˢ.574		80″.29	
D′ψ α, Dω α	+0.04		+0.25		0.00		+0.01		0.00		0.00		0.00		+0.03	
Dψ δ, Dω δ	−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Argûs. Mag. 3.0				42 Leonis Minoris. Mag. 5.4				η Argûs. Var. 1.6–6.6				μ Argûs. Mag. 2.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 39		−63 56		10 41		+31 7		10 41		−59 13		10 43		−48 57	
	s		″		s		″		s		″		s		″	
Jan. 0.7	53.70		22.3		6.53		59.0		43.85		39.9		4.62		43.0	
10.6	54.18	48	25.4	31	6.88	35	58.1	9	44.28	43	43.0	31	4.99	37	46.1	31
20.6	54.59	41	28.9	35	7.18	30	57.6	5	44.65	37	46.4	34	5.31	32	49.5	34
30.6	54.91	32	32.6	37	7.45	27	57.5	1	44.95	30	50.1	37	5.57	26	53.0	35
Feb. 9.6	55.15	24	36.4	38	7.66	21	57.8	3	45.18	23	53.9	38	5.77	20	56.6	36
19.5	55.30	15	40.3	39	7.81	15	58.4	6	45.32	14	57.7	38	5.91	14	60.1	35
Mar. 1.5	55.36	6	44.1	38	7.91	10	59.4	10	45.39	7	61.4	37	5.98	7	63.6	35
11.5	55.33	3	47.9	38	7.96	5	60.5	11	45.38	1	65.0	36	6.00	2	66.9	33
21.4	55.23	10	51.4	35	7.96	0	61.7	12	45.31	7	68.4	34	5.96	4	69.9	30
31.4	55.06	17	54.6	32	7.91	5	63.1	14	45.17	14	71.5	31	5.87	9	72.7	28
Apr. 10.4	54.82	24	57.5	29	7.83	8	64.4	13	44.99	18	74.3	28	5.74	13	75.1	24
20.4	54.54	28	60.0	25	7.72	11	65.7	13	44.76	23	76.7	24	5.58	16	77.2	21
30.3	54.21	33	62.1	21	7.60	12	66.8	11	44.49	27	78.6	19	5.40	18	78.8	16
May 10.3	53.86	35	63.6	15	7.46	14	67.8	10	44.20	29	80.1	15	5.20	20	80.0	12
20.3	53.49	37	64.8	12	7.33	13	68.6	8	43.90	30	81.1	10	4.98	22	80.8	8
30.3	53.10	39	65.4	6	7.19	14	69.2	6	43.59	31	81.6	5	4.76	22	81.0	2
June 9.2	52.72	38	65.4	0	7.06	13	69.5	3	43.28	31	81.6	0	4.55	21	80.9	1
19.2	52.35	37	65.0	4	6.95	11	69.6	1	42.97	31	81.1	5	4.34	21	80.3	6
29.2	51.99	36	64.0	10	6.85	10	69.4	2	42.69	28	80.1	10	4.14	20	79.2	11
July 9.1	51.67	32	62.6	14	6.77	8	69.0	4	42.43	26	78.7	14	3.97	17	77.8	14
19.1	51.39	28	60.7	19	6.72	5	68.3	7	42.20	23	76.9	18	3.82	15	76.0	18
29.1	51.15	24	58.5	22	6.69	3	67.4	9	42.01	19	74.7	22	3.70	12	73.9	21
Aug. 8.1	50.98	17	56.0	25	6.68	1	66.2	12	41.87	14	72.2	25	3.61	9	71.6	23
18.0	50.87	11	53.2	28	6.70	2	64.9	13	41.79	8	69.5	27	3.57	4	69.2	24
28.0	50.83	4	50.4	28	6.75	5	63.3	16	41.77	2	66.8	27	3.58	1	66.7	25
Sept. 7.0	50.88	5	47.5	29	6.84	9	61.5	18	41.82	5	64.0	28	3.63	5	64.2	25
17.0	51.02	14	44.8	27	6.96	12	59.6	19	41.94	12	61.3	27	3.74	11	61.9	23
26.9	51.24	22	42.2	26	7.11	15	57.5	21	42.14	20	58.9	24	3.91	17	59.8	21
Oct. 6.9	51.54	30	40.0	22	7.31	20	55.3	22	42.41	27	56.8	21	4.13	22	58.0	18
16.9	51.93	39	38.1	19	7.55	24	53.0	23	42.75	34	55.1	17	4.41	28	56.6	14
26.8	52.39	46	36.8	13	7.82	27	50.6	24	43.16	41	53.9	12	4.74	33	55.8	8
Nov. 5.8	52.92	53	36.1	7	8.12	30	48.2	24	43.62	46	53.3	6	5.12	38	55.5	3
15.8	53.49	57	36.0	1	8.46	34	45.9	23	44.12	50	53.3	0	5.53	41	55.8	3
25.8	54.09	60	36.5	5	8.83	37	43.7	22	44.65	53	53.9	6	5.97	44	56.6	8
Dec. 5.7	54.69	60	37.7	12	9.20	37	41.7	20	45.19	54	55.1	12	6.42	45	58.1	15
15.7	55.29	60	39.4	17	9.58	38	39.9	18	45.72	53	57.0	19	6.86	44	60.1	20
25.7	55.86	57	41.8	24	9.96	38	38.5	14	46.23	51	59.4	24	7.29	43	62.6	25
35.7	56.38	52	44.6	28	10.32	36	37.4	11	46.70	47	62.2	28	7.68	39	65.5	29
Sec δ, Tan δ	2.277		−2.045		1.168		+0.604		1.955		−1.680		1.523		−1.149	
Mean Place	53^s.091		39″.12		5^s.186		68″.07		43^s.271		55″.88		4^s.037		56″.91	
$D'_\psi\alpha$, $D_\omega\alpha$	−0.02		−0.13		+0.01		+0.04		−0.01		−0.11		−0.01		−0.07	
$D_\psi\delta$, $D_\omega\delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	l Leonis. Mag. 5.3				δ^2 Chamæleon. Mag. 4.6				ν Hydræ. Mag. 3.3				46 Leonis Minoris. Mag. 3.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 10 44		° ′ +10 59		h m 10 44		° ′ −80 4		h m 10 45		° ′ −15 44		h m 10 48		° ′ +34 40	
	s		″		s		″		s		″		s		″	
Jan. 0.7	45.32		58.1		59.96		52.9		23.56		30.6		31.77		33.4	
10.6	45.62	30	56.4	17	61.02	106	55.8	29	23.86	30	33.1	25	32.13	36	32.6	8
20.6	45.90	28	54.9	15	61.90	88	59.1	33	24.13	27	35.7	26	32.45	32	32.2	4
30.6	46.14	24	53.8	11	62.58	68	62.7	36	24.36	23	38.2	25	32.72	27	32.3	1
Feb. 9.6	46.33	19	52.8	10	63.07	49	66.5	38	24.54	18	40.5	23	32.95	23	32.7	4
19.5	46.47	14	52.2	6	63.34	27	70.4	39	24.67	13	42.7	22	33.12	17	33.5	8
Mar. 1.5	46.56	9	51.9	3	63.39	5	74.4	40	24.76	9	44.6	19	33.22	10	34.6	11
11.5	46.61	5	51.8	1	63.25	14	78.4	40	24.80	4	46.3	17	33.28	6	35.9	13
21.5	46.62	1	52.0	2	62.91	34	82.2	38	24.80	0	47.7	14	33.29	1	37.4	15
31.4	46.59	3	52.3	3	62.39	52	85.8	36	24.77	3	48.9	12	33.25	4	38.9	15
Apr. 10.4	46.53	6	52.7	4	61.71	68	89.0	32	24.71	6	49.8	9	33.17	8	40.4	15
20.4	·46.45	8	53.3	6	60.89	82	92.0	30	24.63	8	50.5	7	33.06	11	41.8	14
30.3	46.36	9	53.9	6	59.96	93	94.5	25	24.53	10	50.8	3	32.93	13	43.1	13
May 10.3	46.25	11	54.5	6	58.93	103	96.5	20	24.42	11	51.0	2	32.79	14	44.2	11
20.3	46.14	11	55.1	6	57.84	109	98.1	16	24.31	11	50.9	1	32.65	14	45.0	8
30.3	46.04	10	55.7	6	56.70	114	99.1	10	24.20	11	50.6	3	32.50	15	45.6	6
June 9.2	45.94	10	56.2	5	55.55	115	99.6	5	24.09	11	50.0	6	32.36	14	45.9	3
19.2	45.85	9	56.7	5	54.41	114	99.5	1	23.99	10	49.3	7	32.24	12	46.0	1
29.2	45.77	8	57.0	3	53.31	110	98.9	6	23.90	9	48.4	9	32.13	11	45.7	3
July 9.2	45.71	6	57.3	3	52.29	102	97.7	12	23.83	7	47.4	10	32.04	9	45.2	5
19.1	45.66	5	57.5	2	51.37	92	96.0	17	23.77	6	46.3	11	31.97	7	44.4	8
29.1	45.64	2	57.6	1	50.59	78	94.0	20	23.73	4	45.1	12	31.92	5	43.3	11
Aug. 8.1	45.63	1	57.5	1	49.96	63	91.5	25	23.71	2	43.8	13	31.90	2	42.0	13
18.0	45.65	2	57.3	2	49.51	45	88.8	27	23.72	1	42.6	12	31.92	2	40.4	16
28.0	45.70	5	56.9	4	49.27	24	85.8	30	23.75	3	41.5	11	31.96	4	38.7	17
Sept. 7.0	45.77	7	56.3	6	49.24	3	82.8	30	23.82	7	40.5	10	32.04	8	36.7	20
17.0	45.88	11	55.5	8	49.45	21	79.8	30	23.92	10	39.8	7	32.15	11	34.6	21
26.9	46.02	14	54.4	11	49.88	43	77.0	28	24.06	14	39.2	6	32.31	16	32.3	23
Oct. 6.9	46.19	17	53.2	12	50.54	66	74.4	26	24.23	17	39.0	2	32.50	19	29.8	25
16.9	46.40	21	51.7	15	51.40	86	72.1	23	24.44	21	39.2	2	32.73	23	27.3	25
26.9	46.65	25	50.0	17	52.43	103	70.4	17	24.69	25	39.7	5	33.01	28	24.8	25
Nov. 5.8	46.93	28	48.2	18	53.62	119	69.2	12	24.97	28	40.6	9	33.32	31	22.3	25
15.8	47.23	30	46.2	20	54.92	130	68.6	6	25.29	32	41.9	13	33.66	34	19.9	24
25.8	47.56	33	44.1	21	56.28	136	68.6	0	25.62	33	43.5	16	34.03	37	17.6	23
Dec. 5.7	47.90	34	42.0	21	57.66	138	69.4	8	25.96	34	45.5	20	34.42	39	15.6	20
15.7	48.25	35	39.9	21	59.01	135	70.7	13	26.31	35	47.7	22	34.81	39	13.8	18
25.7	48.59	34	37.9	20	60.28	127	72.7	20	26.64	33	50.1	24	35.20	39	12.4	14
35.7	48.91	32	36.1	18	61.43	115	75.3	26	26.96	32	52.6	25	35.57	37	11.4	10
Sec δ, Tan δ	1.019		+0.194		5.809		−5.723		1.039		−0.282		1.216		+0.692	
Mean Place	$44^s.317$		61″.69		$59^s.235$		71″.68		$22^s.816$		35″.32		$30^s.383$		43″.79	
$D'_\psi\alpha$, $D_\omega\alpha$	0.00		+0.01		−0.05		−0.36		0.00		−0.02		+0.01		+0.04	
$D_\psi\delta$, $D_\omega\delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**54 Leonis.** Mag. 4.5				**ι Antliæ.** Mag. 4.7				**Groombridge 1706.** Mag. 6.3				**α Crateris.** Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 10 50		° ′ +25 12		h m 10 52		° ′ −36 40		h m 10 53		° ′ +78 13		h m 10 55		° ′ −17 50	
	s		″		s		″		s		″		s		″	
Jan. 0.7	58.74		23.3		43.28		20.2		12.48		35.0		35.64		21.7	
10.6	59.07	33	22.2	11	43.62	34	23.1	29	13.60	112	35.8	8	35.95	31	24.3	26
20.6	59.37	30	21.3	9	43.91	29	26.2	31	14.61	101	37.1	13	36.23	28	26.9	26
30.6	59.63	26	20.9	4	44.16	25	29.4	32	15.48	87	39.0	19	36.46	23	29.4	25
Feb. 9.6	59.84	21	20.8	1	44.36	20	32.6	32	16.16	68	41.3	23	36.66	20	31.9	25
19.5	60.00	16	21.0	2	44.51	15	35.8	32	16.65	49	44.0	27	36.80	14	34.2	23
Mar. 1.5	60.10	10	21.5	5	44.60	9	38.8	30	16.92	27	46.9	29	36.90	10	36.2	20
11.5	60.16	6	22.3	8	44.64	4	41.6	28	16.98	6	49.8	29	36.95	5	38.1	19
21.5	60.17	1	23.3	10	44.64	0	44.2	26	16.83	15	52.8	30	36.96	1	39.7	16
31.4	60.14	3	24.4	11	44.59	5	46.4	22	16.49	34	55.6	28	36.93	3	41.0	13
Apr. 10.4	60.08	6	25.5	11	44.51	8	48.4	20	15.98	51	58.1	25	36.88	5	42.0	10
20.4	59.99	9	26.6	11	44.40	11	50.0	16	15.33	65	60.3	22	36.80	8	42.7	7
30.3	59.88	11	27.7	11	44.27	13	51.3	13	14.57	76	62.0	17	36.71	9	43.2	5
May 10.3	59.76	12	28.6	9	44.13	14	52.2	9	13.72	85	63.2	12	36.60	11	43.5	3
20.3	59.64	12	29.4	8	43.98	15	52.7	5	12.83	89	63.9	7	36.49	11	43.5	0
30.3	59.52	12	30.1	7	43.83	15	52.8	1	11.93	90	64.1	2	36.38	11	43.3	2
June 9.2	59.40	12	30.5	4	43.68	15	52.5	3	11.04	89	63.7	4	36.27	11	42.8	5
19.2	59.30	10	30.8	3	43.53	15	51.9	6	10.20	84	62.7	10	36.16	11	42.1	7
29.2	59.20	10	30.8	0	43.39	14	50.9	10	9.42	78	61.2	15	36.07	9	41.2	9
July 9.2	59.13	7	30.6	2	43.27	12	49.6	13	8.73	69	59.3	19	35.98	9	40.2	10
19.1	59.07	6	30.2	4	43.16	11	48.1	15	8.14	59	56.9	24	35.92	6	39.1	11
29.1	59.03	4	29.6	6	43.08	8	46.3	18	7.67	47	54.1	28	35.87	5	37.8	13
Aug. 8.1	59.02	1	28.8	8	43.03	5	44.3	20	7.33	34	51.0	31	35.84	3	36.6	12
18.0	59.03	1	27.8	10	43.00	3	42.3	20	7.13	20	47.7	33	35.83	1	35.3	13
28.0	59.07	4	26.5	13	43.01	1	40.2	21	7.08	5	44.1	36	35.86	3	34.1	12
Sept. 7.0	59.14	7	25.1	14	43.06	5	38.2	20	7.18	10	40.5	36	35.91	5	33.0	11
17.0	59.25	11	23.5	16	43.16	10	36.4	18	7.43	25	36.8	37	36.00	9	32.1	9
26.9	59.39	14	21.7	18	43.30	14	34.8	16	7.83	40	33.0	38	36.13	13	31.5	6
Oct. 6.9	59.57	18	19.7	20	43.48	18	33.5	13	8.39	56	29.4	36	36.29	16	31.1	4
16.9	59.78	21	17.6	21	43.72	24	32.6	9	9.09	70	26.0	34	36.50	21	31.1	0
26.9	60.04	26	15.3	23	44.00	28	32.2	4	9.93	84	22.8	32	36.74	24	31.5	4
Nov. 5.8	60.33	29	13.0	23	44.31	31	32.3	1	10.89	96	20.0	28	37.02	28	32.3	8
15.8	60.65	32	10.8	22	44.66	35	32.9	6	11.96	107	17.6	24	37.32	30	33.5	12
25.8	60.99	34	8.5	23	45.04	38	34.0	11	13.12	116	15.6	20	37.66	34	35.1	16
Dec. 5.7	61.35	36	6.4	21	45.43	39	35.6	16	14.34	122	14.2	14	38.00	34	37.0	19
15.7	61.72	37	4.5	19	45.82	39	37.6	20	15.58	124	13.4	8	38.35	35	39.2	22
25.7	62.08	36	2.8	17	46.20	38	40.1	25	16.80	122	13.2	2	38.69	34	41.6	24
35.7	62.43	35	1.4	14	46.55	35	42.9	28	17.97	117	13.6	4	39.02	33	44.1	25
Sec δ, Tan δ	1.105		+0.471		1.247		−0.745		4.901		+4.798		1.051		−0.322	
Mean Place	57^{s}.560		31″.41		42^{s}.719		30″.90		6^{s}.586		52″.25		34^{s}.975		26″.80	
D′ψ a, Dω a	0.00		+0.03		−0.01		−0.05		+0.04		+0.31		0.00		−0.02	
Dψ δ, Dω δ	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*d* Leonis. Mag. 5.0				*β* Ursæ Majoris. Mag. 2.4				*α* Ursæ Majoris. Mag. 2.0				*χ* Leonis. Mag. 4.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 10 56 s		° ′ + 4 4 ″		h m 10 56 s		° ′ +56 50 ″		h m 10 58 s		° ′ +62 12 ″		h m 11 0 s		° ′ + 7 47 ″	
Jan. 0.7	8.04		44.0		41.84		21.7		28.49		39.6		35.79		61.3	
10.7	8.35	31	42.1	19	42.33	49	21.7	0	29.04	55	39.8	2	36.11	32	59.5	18
20.6	8.63	28	40.3	18	42.78	45	22.3	6	29.55	51	40.5	7	36.39	28	57.8	17
30.6	8.87	24	38.7	16	43.16	38	23.3	10	29.99	44	41.8	13	36.64	25	56.4	14
Feb. 9.6	9.07	20	37.4	13	43.48	32	24.8	15	30.35	36	43.5	17	36.84	20	55.3	11
19.5	9.22	15	36.3	11	43.71	23	26.7	19	30.61	26	45.6	21	36.99	15	54.5	8
Mar. 1.5	9.32	10	35.5	8	43.86	15	28.9	22	30.78	17	48.0	24	37.10	11	53.9	6
11.5	9.38	6	35.0	5	43.93	7	31.3	24	30.85	7	50.6	26	37.16	6	53.6	3
21.5	9.40	2	34.8	2	43.92	1	33.7	24	30.83	2	53.2	26	37.19	3	53.6	0
31.4	9.38	2	34.7	1	43.84	8	36.1	24	30.73	10	55.7	25	37.17	2	53.7	1
Apr. 10.4	9.33	5	34.8	1	43.70	14	38.3	22	30.55	18	58.1	24	37.13	4	54.0	3
20.4	9.26	7	35.1	3	43.51	19	40.4	21	30.32	23	60.2	21	37.06	7	54.4	4
30.4	9.18	8	35.4	3	43.28	23	42.1	17	30.04	28	62.0	18	36.98	8	54.9	5
May 10.3	9.08	10	35.9	5	43.03	25	43.5	14	29.73	31	63.3	13	36.88	10	55.5	6
20.3	8.98	10	36.4	5	42.76	27	44.4	9	29.40	33	64.3	10	36.78	10	56.1	6
30.3	8.88	10	36.9	5	42.49	27	44.9	5	29.06	34	64.7	4	36.68	10	56.7	6
June 9.2	8.78	10	37.5	6	42.23	26	45.0	1	28.73	33	64.7	0	36.58	10	57.3	6
19.2	8.69	9	38.0	5	41.98	25	44.6	4	28.42	31	64.2	5	36.49	9	57.8	5
29.2	8.61	8	38.6	6	41.76	22	43.8	8	28.14	28	63.3	9	36.40	9	58.3	5
July 9.2	8.55	6	39.1	5	41.57	19	42.5	13	27.89	25	61.9	14	36.33	7	58.7	4
19.1	8.49	6	39.6	5	41.41	16	40.9	16	27.68	21	60.0	19	36.28	5	59.0	3
29.1	8.46	3	39.9	3	41.29	12	38.9	20	27.52	16	57.8	22	36.24	4	59.2	2
Aug. 8.1	8.44	2	40.2	3	41.21	8	36.5	24	27.41	11	55.3	25	36.22	2	59.3	1
18.1	8.45	1	40.3	1	41.18	3	33.9	26	27.36	5	52.5	28	36.22	0	59.2	1
28.0	8.48	3	40.3	0	41.20	2	31.1	28	27.36	0	49.4	31	36.25	3	59.0	2
Sept. 7.0	8.54	6	40.1	2	41.27	7	28.1	30	27.43	7	46.2	32	36.31	6	58.6	4
17.0	8.64	10	39.7	4	41.39	12	25.0	31	27.56	13	42.9	33	36.40	9	57.9	7
26.9	8.77	13	39.1	6	41.58	19	21.7	33	27.76	20	39.5	34	36.52	12	57.1	8
Oct. 6.9	8.93	16	38.2	9	41.82	24	18.5	32	28.03	27	36.1	34	36.68	16	56.0	11
16.9	9.12	19	37.1	11	42.12	30	15.3	32	28.37	34	32.8	33	36.87	19	54.6	14
26.9	9.36	24	35.7	14	42.48	36	12.2	31	28.77	40	29.6	32	37.10	23	53.1	15
Nov. 5.8	9.63	27	34.0	17	42.89	41	9.4	28	29.23	46	26.7	29	37.37	27	51.3	18
15.8	9.92	29	32.2	18	43.35	46	6.8	26	29.75	52	24.1	26	37.66	29	49.4	19
25.8	10.24	32	30.2	20	43.84	49	4.5	23	30.31	56	21.9	22	37.98	32	47.3	21
Dec. 5.8	10.58	34	28.1	21	44.36	52	2.6	19	30.90	59	20.1	18	38.32	34	45.1	22
15.7	10.92	34	25.9	22	44.90	54	1.3	13	31.50	60	18.8	13	38.66	34	43.0	21
25.7	11.26	34	23.7	22	45.43	53	0.4	9	32.10	60	18.0	8	39.00	34	40.9	21
35.7	11.58	32	21.7	20	45.94	51	0.1	3	32.69	59	17.9	1	39.33	33	38.9	20
Sec δ, Tan δ	1.003		+0.071		1.828		+1.530		2.145		+1.898		1.009		+0.137	
Mean Place	7^s.183		45″.97		39^s.674		37″.14		25^s.948		55″.90		34^s.917		64″.64	
D′ψ α, Dω α	0.00		0.00		+0.01		+0.10		+0.01		+0.12		0.00		+0.01	
Dψ δ, Dω δ	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ρ^4 Leonis. Mag. 5.7				ψ Ursæ Majoris. Mag. 3.2				β Crateris. Mag. 4.5				δ Leonis. Mag. 2.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	11 2		+ 2 24		11 4		+44 57		11 7		−22 21		11 9		+20 59	
	s		″		s		″		s		″		s		″	
Jan. 0.7	31.87		80.1		51.64		41.5		26.15		16.3		33.24		34.3	
10.7	32.18	31	78.1	20	52.05	41	41.0	5	26.47	32	18.9	26	33.57	33	32.9	14
20.6	32.46	28	76.2	19	52.42	37	41.0	0	26.76	29	21.6	27	33.88	31	31.8	11
30.6	32.70	24	74.5	17	52.75	33	41.4	4	27.01	25	24.4	28	34.14	26	31.0	8
Feb. 9.6	32.90	20	73.1	14	53.02	27	42.3	9	27.21	20	27.0	26	34.37	23	30.6	4
19.5	33.06	16	71.9	12	53.22	20	43.6	13	27.37	16	29.5	25	34.54	17	30.5	1
Mar. 1.5	33.17	11	71.1	8	53.36	14	45.2	16	27.48	11	31.8	23	34.67	13	30.7	2
11.5	33.23	6	70.4	7	53.44	8	47.0	18	27.55	7	33.9	21	34.74	7	31.2	5
21.5	33.26	3	70.1	3	53.46	2	49.0	20	27.57	2	35.8	19	34.77	3	32.0	8
31.4	33.25	1	69.9	2	53.42	4	51.0	20	27.56	1	37.4	16	34.77	0	32.8	8
Apr. 10.4	33.20	5	69.9	0	53.34	8	53.0	20	27.51	5	38.7	13	34.72	5	33.8	10
20.4	33.14	6	70.1	2	53.21	13	54.8	18	27.44	7	39.7	10	34.66	6	34.8	10
30.4	33.06	8	70.4	3	53.06	15	56.4	16	27.35	9	40.4	7	34.57	9	35.8	10
May 10.3	32.96	10	70.8	4	52.89	17	57.8	14	27.25	10	40.9	5	34.47	10	36.8	10
20.3	32.86	10	71.3	5	52.71	18	58.8	10	27.14	11	41.1	2	34.36	11	37.7	9
30.3	32.76	10	71.8	5	52.52	19	59.5	7	27.02	12	41.0	1	34.24	12	38.4	7
June 9.2	32.67	9	72.4	6	52.34	18	59.9	4	26.91	11	40.6	4	34.13	11	38.9	5
19.2	32.58	9	73.0	6	52.18	16	59.8	1	26.80	11	40.0	6	34.03	10	39.3	4
29.2	32.49	9	73.5	5	52.02	16	59.4	4	26.69	11	39.2	8	33.93	10	39.6	3
July 9.2	32.42	7	74.1	6	51.89	13	58.6	8	26.60	9	38.2	10	33.85	8	39.6	0
19.1	32.37	5	74.6	5	51.78	11	57.5	11	26.52	8	37.0	12	33.78	7	39.4	2
29.1	32.33	4	75.0	4	51.70	8	56.0	15	26.46	6	35.7	13	33.74	4	39.0	4
Aug. 8.1	32.30	3	75.3	3	51.64	6	54.3	17	26.42	4	34.3	14	33.71	3	38.5	5
18.1	32.30	0	75.6	3	51.62	2	52.3	20	26.40	2	32.8	15	33.70	1	37.7	8
28.0	32.33	3	75.7	1	51.64	2	50.0	23	26.41	1	31.4	14	33.72	2	36.7	10
Sept. 7.0	32.38	5	75.6	1	51.69	5	47.5	25	26.45	4	30.1	13	33.77	5	35.5	12
17.0	32.47	9	75.3	3	51.79	10	44.8	27	26.53	8	29.0	11	33.86	9	34.0	15
26.9	32.59	12	74.7	6	51.94	15	42.0	28	26.64	11	28.1	9	33.98	12	32.4	16
Oct. 6.9	32.75	16	73.9	8	52.13	19	39.1	29	26.80	16	27.5	6	34.13	15	30.6	18
16.9	32.94	19	72.8	11	52.37	24	36.2	29	27.00	20	27.3	2	34.33	20	28.6	20
26.9	33.17	23	71.5	13	52.65	28	33.3	29	27.24	24	27.4	1	34.56	23	26.5	21
Nov. 5.8	33.43	26	69.9	16	52.98	33	30.5	28	27.51	27	28.0	6	34.83	27	24.2	23
15.8	33.72	29	68.1	18	53.35	37	27.8	27	27.82	31	28.9	9	35.13	30	21.9	23
25.8	34.04	32	66.1	20	53.75	40	25.4	24	28.16	34	30.3	14	35.46	33	19.6	23
Dec. 5.8	34.37	33	64.0	21	54.18	43	23.3	21	28.51	35	32.1	18	35.81	35	17.4	22
15.7	34.71	34	61.8	22	54.61	43	21.6	17	28.87	36	34.2	21	36.17	36	15.3	21
25.7	35.05	34	59.6	22	55.05	44	20.3	13	29.22	35	36.6	24	36.52	35	13.4	19
35.7	35.37	32	57.5	21	55.47	42	19.5	8	29.56	34	39.2	26	36.87	35	11.8	16
Sec δ, Tan δ	1.001		+0.042		1.413		+0.999		1.081		−0.411		1.071		+0.384	
Mean Place	31ˢ.062		81″.76		50ˢ.083		55″.31		25ˢ.582		22″.52		32ˢ.238		42″.12	
D′ψ α, Dω α	0.00		0.00		+0.01		+0.06		0.00		−0.03		0.00		+0.02	
Dψ δ, Dω δ	−0.4		+0.2		−0.4		+0.2		−0.4		+0.2		−0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Leonis. Mag. 3.4				ν Ursæ Majoris. Mag. 3.7				δ Crateris. Mag. 3.8				σ Leonis. Mag. 4.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 11 9 s		° ′ +15 53 ″		h m 11 13 s		° ′ +33 33 ″		h m 11 15 s		° ′ −14 18 ″		h m 11 16 s		° ′ + 6 29 ″	
Jan. 0.7	44.64	32	53.0	16	51.45	36	38.0	10	2.97	32	43.3	25	42.95	32	59.7	20
10.7	44.96	30	51.4	14	51.81	34	37.0	6	3.29	28	45.8	25	43.27	29	57.7	17
20.6	45.26	26	50.0	10	52.15	29	36.4	2	3.57	26	48.3	24	43.56	26	56.0	15
30.6	45.52	22	49.0	7	52.44	25	36.2	3	3.83	21	50.7	22	43.82	21	54.5	13
Feb. 9.6	45.74	17	48.3	4	52.69	19	36.5	6	4.04	16	52.9	21	44.03	17	53.2	9
19.6	45.91	12	47.9	0	52.88	14	37.1	10	4.20	12	55.0	19	44.20	13	52.3	6
Mar. 1.5	46.03	7	47.9	2	53.02	9	38.1	12	4.32	8	56.9	16	44.33	8	51.7	4
11.5	46.10	3	48.1	4	53.11	3	39.3	15	4.40	3	58.5	14	44.41	4	51.3	2
21.5	46.13	0	48.5	6	53.14	1	40.8	15	4.43	0	59.9	12	44.45	0	51.1	1
31.4	46.13	4	49.1	8	53.13	5	42.3	16	4.43	3	61.1	9	44.45	3	51.2	3
Apr. 10.4	46.09	7	49.9	8	53.08	9	43.9	15	4.40	6	62.0	6	44.42	6	51.5	4
20.4	46.02	8	50.7	8	52.99	10	45.4	14	4.34	8	62.6	4	44.36	7	51.9	4
30.4	45.94	10	51.5	8	52.89	13	46.8	13	4.26	9	63.0	2	44.29	9	52.3	6
May 10.3	45.84	10	52.3	8	52.76	13	48.1	10	4.17	10	63.2	1	44.20	9	52.9	6
20.3	45.74	11	53.1	7	52.63	14	49.1	8	4.07	10	63.1	2	44.11	10	53.5	6
30.3	45.63	10	53.8	5	52.49	14	49.9	5	3.97	10	62.9	4	44.01	9	54.1	6
June 9.3	45.53	10	54.3	5	52.35	13	50.4	3	3.87	10	62.5	6	43.92	9	54.7	5
19.2	45.43	9	54.8	3	52.22	12	50.7	0	3.77	10	61.9	8	43.83	9	55.2	5
29.2	45.34	8	55.1	2	52.10	10	50.7	4	3.67	8	61.1	9	43.74	8	55.7	5
July 9.2	45.26	6	55.3	0	52.00	9	50.3	6	3.59	7	60.2	10	43.66	6	56.2	3
19.1	45.20	5	55.3	1	51.91	7	49.7	9	3.52	6	59.2	10	43.60	5	56.5	3
29.1	45.15	2	55.2	3	51.84	4	48.8	12	3.46	4	58.2	11	43.55	3	56.8	1
Aug. 8.1	45.13	1	54.9	5	51.80	2	47.6	15	3.42	2	57.1	10	43.52	1	56.9	0
18.1	45.12	2	54.4	7	51.78	1	46.1	17	3.40	1	56.1	10	43.51	1	56.9	1
28.0	45.14	5	53.7	10	51.79	5	44.4	19	3.41	4	55.1	9	43.52	4	56.8	4
Sept. 7.0	45.19	8	52.7	11	51.84	8	42.5	21	3.45	7	54.2	6	43.56	8	56.4	5
17.0	45.27	12	51.6	13	51.92	12	40.4	23	3.52	10	53.6	5	43.64	10	55.9	8
27.0	45.39	15	50.3	16	52.04	16	38.1	24	3.62	15	53.1	2	43.74	14	55.1	10
Oct. 6.9	45.54	19	48.7	17	52.20	20	35.7	26	3.77	18	52.9	2	43.88	18	54.1	13
16.9	45.73	23	47.0	19	52.40	25	33.1	26	3.95	23	53.1	5	44.06	22	52.8	15
26.9	45.96	26	45.1	21	52.65	28	30.5	26	4.18	26	53.6	9	44.28	26	51.3	18
Nov. 5.8	46.22	30	43.0	22	52.93	32	27.9	26	4.44	30	54.5	12	44.54	28	49.5	19
15.8	46.52	32	40.8	22	53.25	36	25.3	24	4.74	32	55.7	16	44.82	32	47.6	21
25.8	46.84	34	38.6	22	53.61	37	22.9	23	5.06	34	57.3	18	45.14	33	45.5	22
Dec. 5.8	47.18	35	36.4	22	53.98	39	20.6	20	5.40	35	59.1	22	45.47	34	43.3	22
15.7	47.53	35	34.2	20	54.37	39	18.6	16	5.75	34	61.3	23	45.81	34	41.1	21
25.7	47.88	34	32.2	18	54.76	37	17.0	13	6.09	33	63.6	24	46.15	33	39.0	21
35.7	48.22		30.4		55.13		15.7		6.42		66.0		46.48		36.9	
Sec δ, Tan δ	1.040		+0.285		1.200		+0.663		1.032		−0.255		1.006		+0.114	
Mean Place	$43^{s}.709$		$59''.27$		$50^{s}.254$		$49''.59$		$2^{s}.383$		$46''.79$		$42^{s}.175$		$63''.20$	
D′ψ α, Dω α	0.00		+0.02		0.00		+0.04		0.00		−0.02		0.00		+0.01	
Dψ δ. Dω δ	−0.4		+0.2		−0.4		+0.2		−0.4		+0.2		−0.4		+0.2	

Mean Solar Date.	**π Centauri.** Mag. 4.3				**ι Leonis.** Mag. 4.0				**τ Leonis.** Mag. 5.2				**λ Draconis.** Mag. 4.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	11 17		−54 0		11 19		+10 59		11 23		+ 3 19		11 26		+69 47	
	s		″		s		″		s		″		s		″	
Jan. 0.7	5.06		55.8		27.31		66.0		31.60		45.3		21.83		62.1	
10.7	5.50	44	58.6	28	27.64	33	64.2	18	31.92	32	43.3	20	22.57	74	62.2	1
20.6	5.89	39	61.8	32	27.94	30	62.6	16	32.22	30	41.4	19	23.26	69	62.9	7
30.6	6.22	33	65.2	34	28.20	26	61.3	13	32.48	26	39.7	17	23.86	60	64.1	12
Feb. 9.6	6.49	27	68.7	35	28.42	22	60.3	10	32.69	21	38.3	14	24.37	51	65.9	18
19.6	6.70	21	72.3	36	28.60	18	59.6	7	32.87	18	37.2	11	24.77	40	68.1	22
Mar. 1.5	6.84	14	75.9	36	28.73	13	59.2	4	33.00	13	36.3	9	25.04	27	70.7	26
11.5	6.91	7	79.4	35	28.81	8	59.1	1	33.09	9	35.8	5	25.19	15	73.4	27
21.5	6.92	1	82.8	34	28.85	4	59.3	2	33.13	4	35.5	3	25.22	3	76.3	29
31.4	6.88	4	85.9	31	28.86	1	59.6	3	33.14	1	35.4	1	25.13	9	79.1	28
Apr. 10.4	6.78	10	88.7	28	28.83	3	60.1	5	33.12	2	35.4	0	24.93	20	81.8	27
20.4	6.64	14	91.1	24	28.78	5	60.7	6	33.07	5	35.7	3	24.64	29	84.2	24
30.4	6.47	17	93.2	21	28.70	8	61.4	7	33.01	6	36.0	3	24.27	37	86.3	21
May 10.3	6.27	20	94.9	17	28.62	8	62.1	7	32.93	8	36.5	5	23.85	42	88.0	17
20.3	6.05	22	96.1	12	28.52	10	62.8	7	32.84	9	37.0	5	23.39	46	89.2	12
30.3	5.82	23	96.9	8	28.42	10	63.4	6	32.74	10	37.6	6	22.90	49	89.9	7
June 9.3	5.58	24	97.2	3	28.32	10	64.0	6	32.65	9	38.1	5	22.41	49	90.1	2
19.2	5.33	25	97.0	2	28.23	9	64.6	6	32.55	10	38.7	6	21.93	48	89.7	4
29.2	5.09	24	96.4	6	28.14	9	65.0	4	32.47	8	39.3	6	21.48	45	88.8	9
July 9.2	4.87	22	95.3	11	28.06	8	65.3	3	32.39	8	39.8	5	21.06	42	87.5	13
19.1	4.66	21	93.9	14	28.00	6	65.6	3	32.32	7	40.3	5	20.68	38	85.7	18
29.1	4.48	18	92.0	19	27.95	5	65.6	0	32.27	5	40.7	4	20.37	31	83.5	22
Aug. 8.1	4.33	15	89.9	21	27.91	4	65.6	0	32.23	4	41.0	3	20.11	26	80.8	27
18.1	4.23	10	87.5	24	27.90	1	65.3	3	32.21	2	41.1	1	19.93	18	77.9	29
28.0	4.17	6	85.0	25	27.91	1	64.9	4	32.22	1	41.1	0	19.83	10	74.6	33
Sept. 7.0	4.17	0	82.4	26	27.95	4	64.3	6	32.25	3	40.9	2	19.81	2	71.2	34
17.0	4.24	7	79.9	25	28.02	7	63.4	9	32.32	7	40.6	3	19.87	6	67.6	36
27.0	4.36	12	77.5	24	28.13	11	62.4	10	32.42	10	40.0	6	20.03	16	64.0	36
Oct. 6.9	4.56	20	75.4	21	28.27	14	61.1	13	32.56	14	39.1	9	20.28	25	60.3	37
16.9	4.82	26	73.7	17	28.45	18	59.6	15	32.73	17	38.0	11	20.63	35	56.7	36
26.9	5.14	32	72.4	13	28.66	21	57.9	17	32.94	21	36.6	14	21.07	44	53.2	35
Nov. 5.8	5.52	38	71.6	8	28.92	26	55.9	20	33.19	25	35.0	16	21.60	53	50.0	32
15.8	5.96	44	71.3	3	29.21	29	53.9	20	33.47	28	33.2	18	22.21	61	47.1	29
25.8	6.42	46	71.7	4	29.52	31	51.7	22	33.78	31	31.2	20	22.88	67	44.6	25
Dec. 5.8	6.91	49	72.6	9	29.86	34	49.5	22	34.11	33	29.0	22	23.61	73	42.6	20
15.7	7.40	49	74.2	16	30.20	34	47.3	22	34.45	34	26.8	22	24.37	76	41.1	15
25.7	7.89	49	76.3	21	30.55	35	45.2	21	34.80	35	24.6	22	25.14	77	40.2	9
35.7	8.35	46	78.8	25	30.88	33	43.2	20	35.13	33	22.5	21	25.89	75	39.9	3
Sec δ, Tan δ	1.702		−1.377		1.019		+0.194		1.002		+0.058		2.896		+2.718	
Mean Place	4ˢ.821		70″.53		26ˢ.506		71″.12		30ˢ.899		48″.10		18ˢ.842		81″.10	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.01		−0.09		0.00		+0.01		0.00		0.00		+0.01		+0.18	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.2		−0.4		+0.2		−0.4		+0.2		−0.4		+0.1	

Mean Solar Date.	ξ Hydræ. Mag. 3.7				λ Centauri. Mag. 3.3				υ Leonis. Mag. 4.5				π Chamæleontis. Mag. 5.7			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 11 28		° ′ −31 22		h m 11 31		° ′ −62 32		h m 11 32		° ′ − 0 20		h m 11 33		° ′ −75 24	
	s		″		s		″		s		″		s		″	
Jan. 0.7	46.52		45.7		48.36		21.9		33.34		57.6		41.90		55.6	
10.7	46.87	35	48.4	27	48.90	54	24.5	26	33.66	32	59.8	22	42.79	89	58.0	24
20.6	47.19	32	51.2	28	49.39	49	27.5	30	33.96	30	61.8	20	43.59	80	60.8	28
30.6	47.47	28	54.1	29	49.81	42	30.8	33	34.22	26	63.6	18	44.28	69	64.1	33
Feb. 9.6	47.70	23	57.1	30	50.16	35	34.4	36	34.45	23	65.2	16	44.84	56	67.7	36
19.6	47.89	19	59.9	28	50.43	27	38.1	37	34.63	18	66.5	13	45.26	42	71.5	38
Mar. 1.5	48.02	13	62.7	28	50.62	19	41.9	38	34.77	14	67.7	12	45.55	29	75.4	39
11.5	48.11	9	65.3	26	50.72	10	45.6	37	34.87	10	68.5	8	45.69	14	79.3	39
21.5	48.16	5	67.6	23	50.75	3	49.2	36	34.92	5	69.0	5	45.70	1	83.2	39
31.5	48.16	0	69.7	21	50.71	4	52.6	34	34.94	2	69.3	3	45.58	12	86.9	37
Apr. 10.4	48.14	2	71.6	19	50.61	10	55.8	32	34.93	1	69.4	1	45.34	24	90.4	35
20.4	48.08	6	73.1	15	50.44	17	58.7	29	34.89	4	69.3	1	44.99	35	93.7	33
30.4	47.99	9	74.3	12	50.23	21	61.2	25	34.83	6	69.2	1	44.54	45	96.6	29
May 10.3	47.89	10	75.3	10	49.98	25	63.3	21	34.75	8	68.9	3	44.01	53	99.1	25
20.3	47.78	11	75.8	5	49.69	29	64.9	16	34.67	8	68.4	5	43.40	61	101.1	20
30.3	47.65	13	76.1	3	49.38	31	66.1	12	34.58	9	67.9	5	42.75	65	102.6	15
June 9.3	47.52	13	76.0	1	49.05	33	66.8	7	34.49	9	67.4	5	42.05	70	103.7	11
19.2	47.39	13	75.6	4	48.71	34	66.9	1	34.39	10	66.8	6	41.34	71	104.1	4
29.2	47.27	12	74.9	7	48.37	34	66.6	3	34.31	8	66.2	6	40.62	72	104.1	0
July 9.2	47.15	12	74.0	9	48.05	32	65.8	8	34.22	9	65.6	6	39.92	70	103.5	6
19.2	47.04	11	72.7	13	47.74	31	64.5	13	34.15	7	65.0	6	39.26	66	102.3	12
29.1	46.95	9	71.3	14	47.46	28	62.8	17	34.09	6	64.5	5	38.66	60	100.7	16
Aug. 8.1	46.87	8	69.7	16	47.23	23	60.7	21	34.05	4	64.1	4	38.14	52	98.7	20
18.1	46.82	5	68.0	17	47.05	18	58.3	24	34.02	3	63.7	4	37.72	42	96.2	25
28.0	46.80	2	66.3	17	46.93	12	55.7	26	34.02	0	63.5	2	37.43	29	93.5	27
Sept. 7.0	46.82	2	64.6	17	46.88	5	53.0	27	34.04	2	63.5	0	37.27	16	90.6	29
17.0	46.87	5	63.0	16	46.91	3	50.2	28	34.10	6	63.6	1	37.26	1	87.7	29
27.0	46.97	10	61.6	14	47.02	11	47.5	27	34.19	9	64.0	4	37.41	15	84.8	29
Oct. 6.9	47.11	14	60.5	11	47.23	21	45.1	24	34.32	13	64.6	6	37.72	31	82.0	28
16.9	47.30	19	59.7	8	47.52	29	42.9	22	34.49	17	65.5	9	38.18	46	79.5	25
26.9	47.53	23	59.3	4	47.89	37	41.2	17	34.69	20	66.7	12	38.79	61	77.3	22
Nov. 5.9	47.81	28	59.3	0	48.33	44	40.0	12	34.93	24	68.2	15	39.54	75	75.7	16
15.8	48.13	32	59.8	5	48.84	51	39.3	7	35.21	28	69.9	17	40.39	85	74.6	11
25.8	48.47	34	60.8	10	49.40	56	39.2	1	35.52	31	71.8	19	41.33	94	74.1	5
Dec. 5.8	48.84	37	62.3	15	49.99	59	39.7	5	35.84	32	73.9	21	42.31	98	74.3	2
15.7	49.22	38	64.1	18	50.59	60	40.9	12	36.18	34	76.1	22	43.32	101	75.1	8
25.7	49.60	38	66.3	22	51.18	59	42.7	18	36.52	34	78.3	22	44.30	98	76.5	14
35.7	49.96	36	68.8	25	51.75	57	44.9	22	36.86	34	80.5	22	45.24	94	78.6	21
Sec δ, Tan δ	1.171		−0.610		2.169		−1.925		1.000		−0.006		3.973		−3.845	
Mean Place	$46^s.165$		$54''.27$		$48^s.391$		$38''.11$		$32^s.727$		$55''.75$		$42^s.373$		$73''.65$	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		−0.04		−0.01		−0.13		0.00		0.00		−0.01		−0.25	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.1		−0.4		+0.1		−0.4		+0.1		−0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**3 Draconis.** Mag. 5.5				**ζ Crateris.** Mag. 4.9				**χ Ursæ Majoris.** Mag. 3.8				**β Leonis.** Mag. 2.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 11 37		° ′ +67 12		h m 11 40		° ′ −17 52		h m 11 41		° ′ +48 14		h m 11 44		° ′ +15 2	
	s		″		s		″		s		″		s		″	
Jan. 0.7	43.77	68	55.9	1	24.52	34	17.4	24	32.28	44	66.0	8	41.18	34	62.8	19
10.7	44.45	63	55.8	4	24.86	30	19.8	25	32.72	41	65.2	2	41.52	31	60.9	15
20.7	45.08	57	56.2	11	25.16	28	22.3	25	33.13	37	65.0	3	41.83	28	59.4	12
30.6	45.65	48	57.3	16	25.44	23	24.8	24	33.50	32	65.3	8	42.11	24	58.2	8
Feb. 9.6	46.13	39	58.9	20	25.67	19	27.2	23	33.82	26	66.1	12	42.35	20	57.4	5
19.6	46.52	28	60.9	24	25.86	15	29.5	21	34.08	20	67.3	17	42.55	16	56.9	2
Mar. 1.5	46.80	16	63.3	27	26.01	10	31.6	18	34.28	13	69.0	19	42.71	11	56.7	1
11.5	46.96	6	66.0	28	26.11	6	33.4	16	34.41	6	70.9	22	42.82	6	56.8	4
21.5	47.02	5	68.8	28	26.17	3	35.0	14	34.47	1	73.1	22	42.88	3	57.2	6
31.5	46.97	15	71.6	27	26.20	1	36.4	11	34.48	5	75.3	22	42.91	0	57.8	7
Apr. 10.4	46.82	23	74.3	25	26.19	3	37.5	9	34.43	10	77.5	22	42.91	4	58.5	9
20.4	46.59	29	76.8	22	26.16	6	38.4	6	34.33	13	79.7	19	42.87	6	59.4	9
30.4	46.30	36	79.0	18	26.10	8	39.0	4	34.20	16	81.6	17	42.81	7	60.3	9
May 10.4	45.94	39	80.8	14	26.02	8	39.4	2	34.04	19	83.3	14	42.74	9	61.2	9
20.3	45.55	42	82.2	8	25.94	10	39.6	1	33.85	19	84.7	11	42.65	10	62.1	8
30.3	45.13	42	83.0	4	25.84	10	39.5	3	33.66	20	85.8	6	42.55	10	62.9	7
June 9.3	44.71	42	83.4	1	25.74	10	39.2	4	33.46	20	86.4	3	42.45	10	63.6	6
19.2	44.29	41	83.3	7	25.64	10	38.8	7	33.26	19	86.7	2	42.35	10	64.2	4
29.2	43.88	38	82.6	11	25.54	10	38.1	8	33.07	17	86.5	5	42.25	9	64.6	3
July 9.2	43.50	34	81.5	17	25.44	9	37.3	9	32.90	16	86.0	10	42.16	8	64.9	1
19.2	43.16	29	79.8	20	25.35	7	36.4	11	32.74	14	85.0	14	42.08	7	65.0	0
29.1	42.87	24	77.8	25	25.28	6	35.3	11	32.60	11	83.6	17	42.01	6	65.0	3
Aug. 8.1	42.63	18	75.3	28	25.22	4	34.2	11	32.49	8	81.9	20	41.95	4	64.7	4
18.1	42.45	12	72.5	31	25.18	2	33.1	11	32.41	4	79.9	23	41.91	1	64.3	6
28.1	42.33	4	69.4	33	25.16	1	32.0	10	32.37	0	77.6	26	41.90	1	63.7	9
Sept. 7.0	42.29	3	66.1	35	25.17	4	31.0	9	32.37	4	75.0	29	41.91	4	62.8	11
17.0	42.32	12	62.6	36	25.21	8	30.1	7	32.41	9	72.1	30	41.95	8	61.7	13
27.0	42.44	19	59.0	37	25.29	13	29.4	4	32.50	14	69.1	31	42.03	12	60.4	16
Oct. 6.9	42.63	29	55.3	36	25.42	16	29.0	1	32.64	19	66.0	32	42.15	15	58.8	17
16.9	42.92	37	51.7	35	25.58	21	28.9	3	32.83	24	62.8	32	42.30	20	57.1	20
26.9	43.29	45	48.2	33	25.79	25	29.2	6	33.07	30	59.6	31	42.50	23	55.1	21
Nov. 5.9	43.74	53	44.9	30	26.04	28	29.8	10	33.37	35	56.5	30	42.73	27	53.0	22
15.8	44.27	60	41.9	27	26.32	32	30.8	14	33.72	39	53.5	27	43.00	31	50.8	23
25.8	44.87	65	39.2	22	26.64	34	32.2	17	34.11	42	50.8	25	43.31	33	48.5	24
Dec. 5.8	45.52	68	37.0	17	26.98	35	33.9	20	34.53	44	48.3	21	43.64	34	46.1	22
15.8	46.20	69	35.3	11	27.33	36	35.9	22	34.97	46	46.2	16	43.98	35	43.9	22
25.7	46.89	69	34.2	5	27.69	34	38.1	24	35.43	45	44.6	11	44.33	34	41.7	20
35.7	47.58		33.7		28.03		40.5		35.88		43.5		44.67		39.7	
Sec δ, Tan δ	2.582		+2.381		1.051		−0.322		1.502		+1.120		1.036		+0.269	
Mean Place	41ˢ.275		75″.34		24ˢ.116		21″.25		30ˢ.909		82″.62		40ˢ.466		70″.28	
D′ψ α, Dω α	+0.01		+0.16		0.00		−0.02		0.00		+0.07		0.00		+0.02	
Dψ δ, Dω δ	−0.4		+0.1		−0.4		+0.1		−0.4		+0.1		−0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**β Virginis.** Mag. 3.8				**Groombridge 1830.** Mag. 6.5				**γ Ursæ Majoris.** Mag. 2.5				**π Virginis.** Mag. 4.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 11 46		° ′ + 2 14		h m 11 48		° ′ +38 19		h m 11 49		° ′ +54 9		h m 11 56		° ′ + 7 5	
	s		″		s		″		s		″		s		″	
Jan. 0.7	13.50		54.8		2.66		54.9		20.35		64.3		28.51		32.6	
10.7	13.83	33	52.6	22	3.07	41	53.6	13	20.84	49	63.7	6	28.84	33	30.6	20
20.7	14.13	30	50.7	19	3.45	38	52.7	9	21.30	46	63.6	1	29.15	31	28.8	18
30.6	14.41	28	48.9	18	3.79	34	52.4	3	21.72	42	64.0	4	29.44	29	27.2	16
Feb. 9.6	14.65	24	47.4	15	4.09	30	52.5	1	22.08	36	65.0	10	29.69	25	25.9	13
19.6	14.85	20	46.2	12	4.33	24	53.1	6	22.38	30	66.5	15	29.89	20	24.9	10
Mar. 1.6	15.00	15	45.2	10	4.53	20	54.0	9	22.60	22	68.3	18	30.06	17	24.3	6
11.5	15.11	11	44.6	6	4.66	13	55.3	13	22.75	15	70.5	22	30.18	12	23.9	4
21.5	15.18	7	44.2	4	4.74	8	56.9	16	22.83	8	72.9	24	30.26	8	23.8	1
31.5	15.21	3	44.0	2	4.78	4	58.5	16	22.84	1	75.3	24	30.30	4	23.9	1
Apr. 10.4	15.21	0	44.0	0	4.76	2	60.3	18	22.79	5	77.8	25	30.31	1	24.3	4
20.4	15.19	2	44.2	2	4.71	5	62.0	17	22.68	11	80.1	23	30.29	2	24.8	5
30.4	15.14	5	44.6	4	4.63	8	63.6	16	22.52	16	82.3	22	30.24	5	25.3	5
May 10.4	15.08	6	45.0	4	4.52	11	65.0	14	22.33	19	84.1	18	30.18	6	26.0	7
20.3	15.00	8	45.5	5	4.40	12	66.2	12	22.12	21	85.6	15	30.11	7	26.7	7
30.3	14.91	9	46.1	6	4.26	14	67.1	9	21.88	24	86.7	11	30.02	9	27.3	6
June 9.3	14.82	9	46.6	5	4.12	14	67.7	6	21.64	24	87.4	7	29.93	9	28.0	7
19.3	14.73	9	47.2	6	3.98	14	68.0	3	21.40	24	87.7	3	29.84	9	28.6	6
29.2	14.64	9	47.8	6	3.84	14	68.0	0	21.17	23	87.5	2	29.75	9	29.2	6
July 9.2	14.56	8	48.3	5	3.71	13	67.6	4	20.94	23	86.8	7	29.66	9	29.7	5
19.2	14.48	8	48.8	5	3.60	11	66.8	8	20.74	20	85.7	11	29.58	8	30.0	3
29.1	14.42	6	49.2	4	3.50	10	65.7	11	20.56	18	84.2	15	29.50	8	30.3	3
Aug. 8.1	14.37	5	49.5	3	3.42	8	64.3	14	20.42	14	82.3	19	29.44	6	30.4	1
18.1	14.33	4	49.7	2	3.37	5	62.6	17	20.31	11	80.1	22	29.40	4	30.4	0
28.1	14.32	1	49.8	1	3.34	3	60.6	20	20.24	7	77.5	26	29.37	3	30.2	2
Sept. 7.0	14.33	1	49.7	1	3.35	1	58.3	23	20.21	3	74.6	29	29.37	0	29.8	4
17.0	14.38	5	49.3	4	3.40	5	55.8	25	20.23	2	71.6	30	29.41	4	29.2	6
27.0	14.45	7	48.8	5	3.48	8	53.1	27	20.31	8	68.3	33	29.47	6	28.3	9
Oct. 7.0	14.57	12	48.0	8	3.61	13	50.2	29	20.45	14	65.0	33	29.57	10	27.3	10
16.9	14.72	15	46.9	11	3.79	18	47.2	30	20.64	19	61.6	34	29.72	15	25.9	14
26.9	14.91	19	45.6	13	4.01	22	44.1	31	20.90	26	58.2	34	29.90	18	24.4	15
Nov. 5.9	15.15	24	44.1	15	4.28	27	41.0	31	21.21	31	54.9	33	30.13	23	22.6	18
15.8	15.42	27	42.3	18	4.59	31	38.0	30	21.58	37	51.8	31	30.39	26	20.6	20
25.8	15.72	30	40.3	20	4.95	36	35.1	29	22.00	42	49.0	28	30.68	29	18.5	21
Dec. 5.8	16.04	32	38.1	22	5.33	38	32.4	27	22.46	46	46.5	25	31.00	32	16.2	23
15.8	16.38	34	35.9	22	5.73	40	30.0	24	22.94	48	44.4	21	31.34	34	14.0	22
25.7	16.73	35	33.7	22	6.15	42	28.0	20	23.44	50	42.9	15	31.68	34	11.8	22
35.7	17.07	34	31.5	22	6.56	41	26.4	16	23.94	50	41.8	11	32.02	34	9.7	21
Sec δ, Tan δ	1.001		+0.039		1.275		+0.791		1.708		+1.385		1.008		+0.124	
Mean Place	$12^{s}.935$		58″.01		$1^{s}.607$		69″.50		$18^{s}.844$		82″.53		$27^{s}.958$		37″.95	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		0.00		0.00		+0.05		0.00		+0.09		0.00		+0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		+0.1		−0.4		+0.1		−0.4		0.0		−0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	o Virginis. Mag. 4.2				δ Centauri. Mag. 2.9				ε Corvi. Mag. 3.2				4 H. Draconis. Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 0		+ 9 12		12 3		−50 14		12 5		−22 8		12 8		+78 4	
	s		″		s		″		s		″		s		″	
Jan. 0.7	50.28		31.8		53.58		24.0		42.18		24.9		14.83		76.8	
10.7	50.62	34	29.8	20	54.03	45	26.4	24	42.53	35	27.3	24	16.01	118	76.6	2
20.7	50.94	32	28.0	18	54.44	41	29.1	27	42.85	32	29.8	25	17.14	113	77.0	4
30.6	51.22	28	26.5	15	54.82	38	32.1	30	43.15	30	32.4	26	18.19	105	78.0	10
Feb. 9.6	51.47	25	25.3	12	55.14	32	35.3	32	43.41	26	34.9	25	19.11	92	79.6	16
19.6	51.68	21	24.4	9	55.41	27	38.7	34	43.63	22	37.3	24	19.87	76	81.8	22
Mar. 1.6	51.85	17	23.9	5	55.63	22	42.0	33	43.80	17	39.5	22	20.45	58	84.3	25
11.5	51.98	13	23.7	2	55.78	15	45.3	33	43.93	13	41.6	21	20.83	38	87.1	28
21.5	52.06	8	23.7	0	55.88	10	48.6	33	44.03	10	43.4	18	21.01	18	90.1	30
31.5	52.11	5	24.0	3	55.92	4	51.6	30	44.08	5	45.1	17	20.99	2	93.1	30
Apr. 10.5	52.12	1	24.4	4	55.92	0	54.4	28	44.09	1	46.5	14	20.78	21	96.1	30
20.4	52.10	2	25.0	6	55.87	5	57.0	26	44.08	1	47.6	11	20.40	38	98.9	28
30.4	52.06	4	25.7	7	55.79	8	59.2	22	44.05	3	48.5	9	19.86	54	101.3	24
May 10.4	52.00	6	26.4	7	55.67	12	61.1	19	43.99	6	49.1	6	19.19	67	103.4	21
20.3	51.93	7	27.2	8	55.52	15	62.6	15	43.91	8	49.5	4	18.42	77	105.0	16
30.3	51.84	9	27.9	7	55.36	16	63.7	11	43.83	8	49.7	2	17.57	85	106.1	11
June 9.3	51.75	9	28.6	7	55.17	19	64.4	7	43.73	10	49.6	1	16.68	89	106.7	6
19.3	51.66	9	29.3	7	54.97	20	64.7	3	43.63	10	49.3	3	15.77	91	106.7	0
29.2	51.56	10	29.8	5	54.76	21	64.5	2	43.52	11	48.8	5	14.87	90	106.2	5
July 9.2	51.47	9	30.3	5	54.56	20	63.9	6	43.41	11	48.1	7	13.99	88	105.2	10
19.2	51.38	9	30.6	3	54.36	20	62.9	10	43.31	10	47.2	9	13.17	82	103.6	16
29.2	51.31	7	30.8	2	54.17	19	61.5	14	43.21	10	46.2	10	12.43	74	101.5	21
Aug. 8.1	51.24	7	30.8	0	54.00	17	59.8	17	43.13	8	45.0	12	11.77	66	99.0	25
18.1	51.19	5	30.7	1	53.86	14	57.8	20	43.06	7	43.8	12	11.22	55	96.1	29
28.1	51.17	2	30.4	3	53.76	10	55.6	22	43.02	4	42.6	12	10.78	44	92.9	32
Sept. 7.0	51.17	0	29.9	5	53.71	5	53.3	23	43.01	1	41.4	12	10.48	30	89.4	35
17.0	51.19	2	29.2	7	53.70	1	51.0	23	43.02	1	40.3	11	10.32	16	85.7	37
27.0	51.25	6	28.2	10	53.76	6	48.8	22	43.08	6	39.4	9	10.32	0	81.9	38
Oct. 7.0	51.35	10	27.0	12	53.88	12	46.7	21	43.18	10	38.7	7	10.47	15	78.0	39
16.9	51.49	14	25.6	14	54.06	18	44.8	19	43.32	14	38.3	4	10.78	31	74.2	38
26.9	51.67	18	23.9	17	54.31	25	43.4	14	43.51	19	38.3	0	11.25	47	70.4	38
Nov. 5.9	51.89	22	22.0	19	54.63	32	42.3	11	43.75	24	38.6	3	11.88	63	66.9	35
15.9	52.15	26	20.0	20	54.99	36	41.7	6	44.02	27	39.3	7	12.66	78	63.6	33
25.8	52.44	29	17.8	22	55.41	42	41.7	0	44.33	31	40.4	11	13.58	92	60.8	28
Dec. 5.8	52.76	32	15.5	23	55.85	44	42.3	6	44.67	34	41.8	14	14.61	103	58.3	25
15.8	53.09	33	13.2	23	56.32	47	43.4	11	45.02	35	43.6	18	15.72	111	56.5	18
25.7	53.44	35	11.0	22	56.79	47	45.0	16	45.38	36	45.6	20	16.89	117	55.2	13
35.7	53.78	34	8.9	21	57.25	46	47.0	20	45.74	36	47.9	23	18.07	118	54.6	6
Sec δ, Tan δ	1.013		+0.162		1.564		−1.202		1.080		−0.407		4.845		+4.741	
Mean Place	$49^{s}.737$		$37''.98$		$53^{s}.700$		$36''.97$		$41^{s}.963$		$29''.48$		$11^{s}.109$		$98''.75$	
$D'_{\psi}a$, $D_{\omega}a$	0.00		+0.01		0.00		−0.08		0.00		−0.03		0.00		+0.32	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		0.0		−0.4		0.0		−0.4		0.0		−0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Crucis. Mag. 3.1				δ Ursæ Majoris. Mag. 3.4				γ Corvi. Mag. 2.8				2 Canum Venat. Mag. 5.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 12 10		° ′ −58 16		h m 12 11		° ′ +57 29		h m 12 11		° ′ −17 3		h m 12 11		° ′ +41 7	
	s		″		s		″		s		″		s		″	
Jan. 0.7	34.18		0.6		12.06		77.7		23.09		49.2		50.23		63.0	
10.7	34.71	53	2.8	22	12.59	53	76.9	8	23.43	34	51.5	23	50.64	41	61.7	13
20.7	35.20	49	5.4	26	13.10	51	76.6	3	23.75	32	53.9	24	51.03	39	60.9	8
30.6	35.64	44	8.4	30	13.56	46	77.0	4	24.05	30	56.3	24	51.39	36	60.7	2
Feb. 9.6	36.03	39	11.6	32	13.97	41	77.9	9	24.31	26	58.6	23	51.71	32	60.9	2
19.6	36.35	32	15.1	35	14.32	35	79.3	14	24.53	22	60.8	22	51.98	27	61.6	7
Mar. 1.6	36.60	25	18.6	35	14.59	27	81.2	19	24.71	18	62.8	20	52.19	21	62.8	12
11.5	36.78	18	22.1	35	14.78	19	83.4	22	24.84	13	64.6	18	52.35	16	64.3	15
21.5	36.90	12	25.6	35	14.90	12	85.9	25	24.94	10	66.1	15	52.45	10	66.1	18
31.5	36.96	6	29.0	34	14.94	4	88.5	26	25.00	6	67.5	14	52.51	6	68.1	20
Apr. 10.5	36.96	0	32.1	31	14.91	3	91.1	26	25.03	3	68.6	11	52.51	0	70.2	21
20.4	36.90	6	35.0	29	14.82	9	93.7	26	25.02	1	69.4	8	52.47	4	72.2	20
30.4	36.79	11	37.6	26	14.67	15	96.1	24	24.99	3	70.0	6	52.39	8	74.2	20
May 10.4	36.64	15	39.9	23	14.48	19	98.1	20	24.94	5	70.5	5	52.28	11	76.1	19
20.3	36.45	19	41.7	18	14.25	23	99.9	18	24.87	7	70.7	2	52.15	13	77.7	16
30.3	36.24	21	43.2	15	14.00	25	101.2	13	24.79	8	70.7	0	52.00	15	79.0	13
June 9.3	35.99	25	44.2	10	13.73	27	102.1	9	24.71	8	70.5	2	51.85	15	79.9	9
19.3	35.73	26	44.7	5	13.45	28	102.6	5	24.61	10	70.1	4	51.69	16	80.6	7
29.2	35.46	27	44.7	0	13.17	28	102.5	1	24.51	10	69.6	5	51.52	17	80.9	3
July 9.2	35.18	28	44.3	4	12.91	26	102.0	5	24.41	10	68.9	7	51.36	16	80.7	2
19.2	34.91	27	43.4	9	12.66	25	101.0	10	24.31	10	68.1	8	51.22	14	80.2	5
29.2	34.66	25	42.1	13	12.43	23	99.6	14	24.22	9	67.2	9	51.08	14	79.3	9
Aug. 8.1	34.43	23	40.4	17	12.23	20	97.8	18	24.14	8	66.2	10	50.96	12	78.1	12
18.1	34.23	20	38.4	20	12.07	16	95.5	23	24.07	7	65.2	10	50.87	9	76.6	15
28.1	34.08	15	36.1	23	11.94	13	92.9	26	24.03	4	64.2	10	50.80	7	74.7	19
Sept. 7.0	33.99	9	33.6	25	11.86	8	90.0	29	24.01	2	63.3	9	50.76	4	72.5	22
17.0	33.96	3	31.0	26	11.84	2	86.9	31	24.03	2	62.6	7	50.76	0	70.0	25
27.0	34.00	4	28.5	25	11.87	3	83.6	33	24.08	5	61.9	7	50.80	4	67.3	27
Oct. 7.0	34.12	12	26.1	24	11.96	9	80.1	35	24.17	9	61.5	4	50.89	9	64.4	29
16.9	34.32	20	23.9	22	12.12	16	76.5	36	24.30	13	61.4	1	51.03	14	61.4	30
26.9	34.60	28	22.0	19	12.35	23	73.0	35	24.48	18	61.6	2	51.21	18	58.3	31
Nov. 5.9	34.95	35	20.6	14	12.65	30	69.5	35	24.71	23	62.2	6	51.45	24	55.2	31
15.9	35.37	42	19.6	10	13.01	36	66.2	33	24.97	26	63.1	9	51.74	29	52.1	31
25.8	35.85	48	19.3	3	13.42	41	63.2	30	25.27	30	64.3	12	52.07	33	49.2	29
Dec. 5.8	36.37	52	19.5	2	13.89	47	60.5	27	25.60	33	65.9	16	52.44	37	46.5	27
15.8	36.91	54	20.2	7	14.39	50	58.2	23	25.94	34	67.8	19	52.83	39	44.0	25
25.7	37.46	55	21.6	14	14.92	53	56.5	17	26.30	36	69.9	21	53.24	41	42.0	20
35.7	38.00	54	23.5	19	15.45	53	55.3	12	26.65	35	72.1	22	53.66	42	40.4	16
Sec δ, Tan δ	1.902		−1.617		1.861		+1.570		1.046		−0.307		1.328		+0.873	
Mean Place	34ˢ.538		15″.14		10ˢ.664		97″.55		22ˢ.859		51″.82		49ˢ.308		79″.40	
D′ψ a, Dω a	0.00		−0.11		0.00		+0.10		0.00		−0.02		0.00		+0.06	
Dψ δ, Dω δ	−0.4		0.0		−0.4		0.0		−0.4		0.0		−0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Chamæleontis. Mag. 4.4				η Virginis. Mag. 4.0				α¹ Crucis. Mag. 1.6				20 Comæ. Mag. 5.7			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 12 13		° ′ −78 49		h m 12 15		° ′ − 0 11		h m 12 21		° ′ −62 37		h m 12 25		° ′ +21 21	
	s		″		s		″		s		″		s		″	
Jan. 0.7	14.65		47.3		30.72		23.7		47.62		6.4		24.69		68.8	
10.7	15.88	123	49.1	18	31.06	34	25.9	22	48.22	60	8.4	20	25.04	35	67.0	18
20.7	17.02	114	51.5	24	31.38	32	27.9	20	48.78	56	10.8	24	25.38	34	65.5	15
30.7	18.05	103	54.3	28	31.67	29	29.8	19	49.28	50	13.7	29	25.70	32	64.3	12
Feb. 9.6	18.94	89	57.5	32	31.93	26	31.4	16	49.73	45	16.8	31	25.98	28	63.6	7
19.6	19.67	73	61.0	35	32.15	22	32.8	14	50.11	38	20.2	34	26.22	24	63.3	3
Mar. 1.6	20.24	57	64.7	37	32.33	18	33.9	11	50.41	30	23.8	36	26.42	20	63.4	1
11.5	20.64	40	68.6	39	32.47	14	34.7	8	50.64	23	27.4	36	26.57	15	63.8	4
21.5	20.87	23	72.5	39	32.57	10	35.3	6	50.80	16	31.0	36	26.68	11	64.5	7
31.5	20.93	6	76.4	39	32.63	6	35.5	2	50.88	8	34.5	35	26.75	7	65.5	10
Apr. 10.5	20.82	11	80.1	37	32.66	3	35.6	1	50.89	1	37.8	33	26.79	4	66.7	12
20.4	20.55	27	83.6	35	32.66	0	35.6	0	50.84	5	40.9	31	26.78	1	68.0	13
30.4	20.14	41	86.9	33	32.63	3	35.3	3	50.73	11	43.7	28	26.75	3	69.3	13
May 10.4	19.60	54	89.8	29	32.59	4	34.9	4	50.57	16	46.2	25	26.70	5	70.6	13
20.4	18.94	66	92.3	25	32.53	6	34.5	4	50.36	21	48.3	21	26.63	7	71.8	12
30.3	18.18	76	94.4	21	32.45	8	33.9	6	50.12	24	50.0	17	26.54	9	72.9	11
June 9.3	17.34	84	96.0	16	32.37	8	33.4	5	49.84	28	51.2	12	26.44	10	73.9	10
19.3	16.44	90	97.1	11	32.28	9	32.8	6	49.53	31	52.0	8	26.34	10	74.7	8
29.2	15.50	94	97.6	5	32.19	9	32.2	6	49.20	33	52.2	2	26.23	11	75.2	5
July 9.2	14.55	95	97.6	0	32.10	9	31.6	6	48.87	33	52.0	2	26.12	11	75.6	4
19.2	13.62	93	97.0	6	32.01	9	31.1	5	48.54	33	51.3	7	26.01	11	75.7	1
29.2	12.74	88	95.9	11	31.93	8	30.6	5	48.23	31	50.1	12	25.92	9	75.6	1
Aug. 8.1	11.94	80	94.3	16	31.86	7	30.2	4	47.94	29	48.5	16	25.83	9	75.2	4
18.1	11.25	69	92.2	21	31.80	6	29.9	3	47.69	25	46.5	20	25.75	8	74.5	7
28.1	10.69	56	89.8	24	31.76	4	29.7	2	47.49	20	44.2	23	25.70	5	73.6	9
Sept. 7.1	10.30	39	87.1	27	31.74	2	29.7	0	47.35	14	41.7	25	25.66	4	72.5	11
17.0	10.09	21	84.2	29	31.76	2	29.9	2	47.29	6	39.1	26	25.66	0	71.1	14
27.0	10.08	1	81.2	30	31.80	4	30.3	4	47.31	2	36.5	26	25.70	4	69.4	17
Oct. 7.0	10.28	20	78.2	30	31.88	8	30.9	6	47.41	10	33.9	26	25.77	7	67.5	19
16.9	10.70	42	75.4	28	32.01	13	31.8	9	47.61	20	31.5	24	25.88	11	65.4	21
26.9	11.32	62	72.9	25	32.18	17	33.0	12	47.90	29	29.4	21	26.04	16	63.1	23
Nov. 5.9	12.14	82	70.8	21	32.38	20	34.4	14	48.28	38	27.7	17	26.24	20	60.6	25
15.9	13.12	98	69.2	16	32.63	25	36.0	16	48.73	45	26.5	12	26.48	24	58.1	25
25.8	14.24	112	68.1	11	32.92	29	37.9	19	49.25	52	25.8	7	26.76	28	55.5	26
Dec. 5.8	15.46	122	67.6	5	33.23	31	40.0	21	49.82	57	25.8	0	27.08	32	52.9	26
15.8	16.73	127	67.8	2	33.56	33	42.2	22	50.42	60	26.3	5	27.42	34	50.5	24
25.8	18.03	130	68.6	8	33.90	34	44.4	22	51.04	62	27.4	11	27.77	35	48.2	23
35.7	19.30	127	70.0	14	34.24	34	46.6	22	51.65	61	29.0	16	28.13	36	46.2	20
Sec δ, Tan δ	5.165		−5.067		1.000		−0.003		2.175		−1.931		1.074		+0.391	
Mean Place	16ˢ.479		64″.95		30ˢ.360		20″.23		48ˢ.244		21″.44		24ˢ.162		80″.06	
D′ψ a, Dω a	+0.01		−0.34		0.00		0.00		0.00		−0.13		0.00		+0.03	
Dψ δ, Dω δ	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Corvi. Mag. 3.1				γ Crucis. Mag. 1.6				8 Canum Venat. Mag. 4.3				κ Draconis. Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 25		−16 2		12 26		−56 37		12 29		+41 48		12 29		+70 14	
	s		″		s		″		s		″		s		″	
Jan. 0.7	24.92		10.5		22.65		40.0		40.55		71.3		51.08		81.5	
10.7	25.26	34	12.8	23	23.17	52	42.0	20	40.96	41	69.9	14	51.84	76	80.8	7
20.7	25.59	33	15.1	23	23.66	49	44.5	25	41.36	40	69.0	9	52.59	75	80.7	1
30.7	25.89	30	17.4	23	24.10	44	47.3	28	41.73	37	68.6	4	53.29	70	81.2	5
Feb. 9.6	26.16	27	19.6	22	24.50	40	50.4	31	42.06	33	68.7	1	53.92	63	82.4	12
19.6	26.40	24	21.7	21	24.84	34	53.7	33	42.35	29	69.3	6	54.46	54	84.1	17
Mar. 1.6	26.59	19	23.7	20	25.12	28	57.1	34	42.58	23	70.4	11	54.89	43	86.3	22
11.6	26.74	15	25.4	17	25.33	21	60.6	35	42.76	18	71.9	15	55.21	32	88.8	25
21.5	26.85	11	26.9	15	25.48	15	64.0	34	42.89	13	73.8	19	55.40	19	91.6	28
31.5	26.92	7	28.2	13	25.56	8	67.3	33	42.96	7	75.8	20	55.47	7	94.6	30
Apr. 10.5	26.96	4	29.2	10	25.60	4	70.4	31	42.98	2	77.9	21	55.43	4	97.5	29
20.4	26.97	1	30.0	8	25.57	3	73.3	29	42.96	2	80.1	22	55.28	15	100.3	28
30.4	26.96	1	30.6	6	25.50	7	75.9	26	42.89	7	82.2	21	55.03	25	103.0	27
May 10.4	26.92	4	31.0	4	25.39	11	78.2	23	42.80	9	84.2	20	54.69	34	105.3	23
20.4	26.86	6	31.2	2	25.24	15	80.1	19	42.68	12	85.9	17	54.29	40	107.2	19
30.3	26.79	7	31.2	0	25.05	19	81.6	15	42.53	15	87.4	15	53.84	45	108.7	15
June 9.3	26.71	8	31.0	2	24.84	21	82.7	11	42.38	15	88.6	12	53.34	50	109.7	10
19.3	26.62	9	30.7	3	24.60	24	83.4	7	42.21	17	89.4	8	52.83	51	110.2	5
29.3	26.52	10	30.2	5	24.35	25	83.6	2	42.04	17	89.8	4	52.31	52	110.1	1
July 9.2	26.42	10	29.6	6	24.10	25	83.3	3	41.87	17	89.9	1	51.80	51	109.5	6
19.2	26.32	10	28.9	7	23.84	26	82.6	7	41.71	16	89.5	4	51.32	48	108.4	11
29.2	26.22	10	28.0	9	23.59	25	81.5	11	41.55	16	88.8	7	50.86	46	106.8	16
Aug. 8.1	26.14	8	27.1	9	23.36	23	79.9	16	41.42	13	87.6	12	50.44	42	104.7	21
18.1	26.06	8	26.2	9	23.16	20	78.0	19	41.30	12	86.1	15	50.08	36	102.2	25
28.1	26.01	5	25.3	9	23.00	16	75.9	21	41.20	10	84.3	18	49.78	30	99.4	28
Sept. 7.1	25.98	3	24.5	8	22.89	11	73.5	24	41.14	6	82.2	21	49.56	22	96.2	32
17.0	25.98	0	23.8	7	22.84	5	71.1	24	41.11	3	79.7	25	49.42	14	92.7	35
27.0	26.02	4	23.2	6	22.86	2	68.6	25	41.12	1	77.0	27	49.37	5	89.0	37
Oct. 7.0	26.09	7	22.9	3	22.95	9	66.2	24	41.18	6	74.1	29	49.42	5	85.2	38
17.0	26.21	12	22.8	1	23.12	17	64.1	21	41.30	12	71.0	31	49.56	14	81.4	38
26.9	26.38	17	23.1	3	23.37	25	62.2	19	41.46	16	67.9	31	49.81	25	77.6	38
Nov. 5.9	26.59	21	23.6	5	23.69	32	60.7	15	41.67	21	64.7	32	50.17	36	73.9	37
15.9	26.84	25	24.5	9	24.08	39	59.7	10	41.94	27	61.5	32	50.63	46	70.4	35
25.8	27.13	29	25.8	13	24.53	45	59.2	5	42.25	31	58.4	31	51.18	55	67.3	31
Dec. 5.8	27.45	32	27.3	15	25.02	49	59.3	1	42.61	36	55.6	28	51.82	64	64.5	28
15.8	27.79	34	29.1	18	25.54	52	59.9	6	42.99	38	53.1	25	52.51	69	62.2	23
25.8	28.14	35	31.2	21	26.07	53	61.1	12	43.39	40	50.9	22	53.25	74	60.5	17
35.7	28.49	35	33.4	22	26.60	53	62.8	17	43.81	42	49.2	17	54.01	76	59.4	11
Sec δ, Tan δ	1.040		−0.287		1.818		−1.519		1.342		+0.895		2.960		+2.786	
Mean Place	24ˢ.761		12″.27		23ˢ.117		53″.72		39ˢ.769		88″.61		49ˢ.192		103″.85	
D′ψ α, Dω α	0.00		−0.02		0.00		−0.10		0.00		+0.06		−0.01		+0.18	
Dψ δ, Dω δ	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	***β* Corvi.** Mag. 2.8				**24 Comæ *seq.*** Mag. 5.2				***α* Muscæ.** Mag. 2.9				***χ* Virginis.** Mag. 4.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 29		−22 55		12 30		+18 50		12 32		−68 39		12 34		− 7 31	
	s		″		s		″		s		″		s		″	
Jan. 0.7	52.03		12.6		49.46		50.4		1.39		26.8		48.54		22.4	
10.7	52.38	35	14.9	23	49.82	36	48.5	19	2.12	73	28.5	17	48.88	34	24.6	22
20.7	52.72	34	17.3	24	50.15	33	46.9	16	2.81	69	30.8	23	49.21	33	26.8	22
30.7	53.04	32	19.7	24	50.46	31	45.7	12	3.44	63	33.5	27	49.51	30	28.8	20
Feb. 9.6	53.32	28	22.1	24	50.75	29	44.8	9	4.00	56	36.6	31	49.78	27	30.7	19
19.6	53.56	24	24.5	24	50.99	24	44.4	4	4.49	49	39.9	33	50.02	24	32.4	17
Mar. 1.6	53.76	20	26.7	22	51.19	20	44.3	1	4.88	39	43.5	36	50.22	20	33.9	15
11.6	53.92	16	28.8	21	51.35	16	44.6	3	5.18	30	47.1	36	50.37	15	35.2	13
21.5	54.04	12	30.7	19	51.46	11	45.2	6	5.39	21	50.8	37	50.49	12	36.2	10
31.5	54.12	8	32.4	17	51.54	8	46.0	8	5.51	12	54.5	37	50.57	8	36.9	7
Apr. 10.5	54.17	5	33.8	14	51.58	4	47.0	10	5.54	3	58.0	35	50.62	5	37.4	5
20.4	54.18	1	35.0	12	51.58	0	48.2	12	5.49	5	61.3	33	50.64	2	37.7	3
30.4	54.17	1	36.0	10	51.56	2	49.4	12	5.36	13	64.4	31	50.64	0	37.9	2
May 10.4	54.13	4	36.7	7	51.51	5	50.6	12	5.16	20	67.2	28	50.61	3	37.8	1
20.4	54.08	5	37.2	5	51.44	7	51.8	12	4.90	26	69.6	24	50.56	5	37.6	2
30.3	54.00	8	37.5	3	51.36	8	52.9	11	4.58	32	71.6	20	50.50	6	37.4	2
June 9.3	53.91	9	37.5	0	51.27	9	53.9	10	4.21	37	73.1	15	50.42	8	37.0	4
19.3	53.82	9	37.4	1	51.17	10	54.7	8	3.80	41	74.1	10	50.34	8	36.5	5
29.3	53.71	11	37.0	4	51.07	10	55.3	6	3.37	43	74.6	5	50.25	9	36.0	5
July 9.2	53.60	11	36.4	6	50.96	11	55.7	4	2.93	44	74.6	0	50.16	9	35.4	6
19.2	53.49	11	35.6	8	50.86	10	55.9	2	2.48	45	74.1	5	50.06	10	34.7	7
29.2	53.38	11	34.7	9	50.76	10	55.9	0	2.05	43	73.1	10	49.97	9	34.1	6
Aug. 8.1	53.29	9	33.6	11	50.67	9	55.6	3	1.65	40	71.6	15	49.88	9	33.5	6
18.1	53.20	9	32.5	11	50.59	8	55.1	5	1.29	36	69.7	19	49.81	7	32.9	6
28.1	53.14	6	31.3	12	50.53	6	54.3	8	1.00	29	67.5	22	49.75	6	32.4	5
Sept. 7.1	53.11	3	30.2	11	50.50	3	53.3	10	0.78	22	65.0	25	49.72	3	32.0	4
17.0	53.10	1	29.1	11	50.49	1	52.0	13	0.66	12	62.3	27	49.71	1	31.8	2
27.0	53.13	3	28.2	9	50.52	3	50.5	15	0.64	2	59.5	28	49.74	3	31.7	1
Oct. 7.0	53.20	7	27.4	8	50.58	6	48.8	17	0.73	9	56.7	28	49.80	6	31.9	2
17.0	53.32	12	26.9	5	50.69	11	46.8	20	0.94	21	54.1	26	49.91	11	32.3	4
26.9	53.49	17	26.7	2	50.84	15	44.6	22	1.26	32	51.7	24	50.06	15	33.0	7
Nov. 5.9	53.70	21	26.9	2	51.04	20	42.3	23	1.70	44	49.7	20	50.26	20	34.0	10
15.9	53.96	26	27.5	6	51.27	23	39.8	25	2.23	53	48.2	15	50.49	23	35.3	13
25.8	54.26	30	28.4	9	51.55	28	37.3	25	2.85	62	47.2	10	50.77	28	36.8	15
Dec. 5.8	54.59	33	29.6	12	51.86	31	34.8	25	3.54	69	46.8	4	51.08	31	38.6	18
15.8	54.94	35	31.2	16	52.20	34	32.3	25	4.27	73	47.0	2	51.41	33	40.6	20
25.8	55.30	36	33.2	20	52.55	35	30.0	23	5.02	75	47.8	8	51.75	34	42.8	22
35.7	55.67	37	35.3	21	52.90	35	27.9	21	5.76	74	49.2	14	52.10	35	45.0	22
Sec δ, Tan δ	1.086		−0.423		1.057		+0.341		2.748		−2.560		1.009		−0.132	
Mean Place	51ˢ.969		16″.60		48ˢ.999		61″.06		2ˢ.447		42″.54		48ˢ.355		20″.80	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		−0.03		0.00		+0.02		+0.01		−0.17		0.00		−0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Centauri. Mag. 2.4				γ Virginis (*mean*). Mag. 2.9				ρ Virginis. Mag. 5.0				76 Ursæ Majoris. Mag. 5.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 12 36		° ′ −48 29		h m 12 37		° ′ − 0 58		h m 12 37		° ′ +10 42		h m 12 37		° ′ +63 10	
	s		″		s		″		s		″		s		″	
Jan. 0.7	45.70		4.2		18.40		44.3		32.28		25.4		50.05		44.5	
10.7	46.16	46	6.2	20	18.74	34	46.5	22	32.62	34	23.3	21	50.66	61	43.4	11
20.7	46.59	43	8.6	24	19.06	32	48.5	20	32.95	33	21.5	18	51.25	59	43.0	4
30.7	46.99	40	11.3	27	19.37	31	50.4	19	33.26	31	20.0	15	51.80	55	43.3	3
Feb. 9.6	47.35	36	14.3	30	19.64	27	52.1	17	33.54	28	18.8	12	52.30	50	44.1	8
19.6	47.66	31	17.3	30	19.87	23	53.5	14	33.78	24	17.9	9	52.74	44	45.6	15
Mar. 1.6	47.92	26	20.5	32	20.07	20	54.6	11	33.98	20	17.4	5	53.09	35	47.5	19
11.6	48.12	20	23.6	31	20.23	16	55.5	9	34.14	16	17.2	2	53.36	27	49.8	23
21.5	48.27	15	26.7	31	20.35	12	56.1	6	34.26	12	17.3	1	53.54	18	52.4	26
31.5	48.38	11	29.7	30	20.43	8	56.4	3	34.34	8	17.6	3	53.63	9	55.1	27
Apr. 10.5	48.43	5	32.5	28	20.48	5	56.5	1	34.39	5	18.2	6	53.63	0	58.0	29
20.4	48.44	1	35.0	25	20.50	2	56.4	1	34.41	2	19.0	8	53.55	8	60.8	28
30.4	48.41	3	37.3	23	20.50	0	56.2	2	34.40	1	19.8	8	53.40	15	63.4	26
May 10.4	48.34	7	39.3	20	20.47	3	55.9	3	34.36	4	20.7	9	53.18	22	65.7	23
20.4	48.24	10	41.0	17	20.42	5	55.4	5	34.31	5	21.6	9	52.92	26	67.7	20
30.3	48.11	13	42.3	13	20.36	6	54.9	5	34.24	7	22.5	9	52.62	30	69.3	16
June 9.3	47.96	15	43.2	9	20.28	8	54.3	6	34.16	8	23.4	9	52.28	34	70.5	12
19.3	47.79	17	43.7	5	20.20	8	53.7	6	34.08	8	24.1	7	51.93	35	71.2	7
29.3	47.60	19	43.8	1	20.11	9	53.1	6	33.98	10	24.7	6	51.57	36	71.4	2
July 9.2	47.41	19	43.5	3	20.02	9	52.5	6	33.88	10	25.2	5	51.22	35	71.0	4
19.2	47.21	20	42.8	7	19.92	10	52.0	5	33.78	10	25.6	4	50.87	35	70.2	8
29.2	47.02	19	41.8	10	19.83	9	51.5	5	33.69	9	25.8	2	50.54	33	68.9	13
Aug. 8.1	46.84	18	40.4	14	19.74	9	51.1	4	33.60	9	25.9	1	50.24	30	67.1	18
18.1	46.68	16	38.7	17	19.67	7	50.8	3	33.53	7	25.7	2	49.98	26	64.9	22
28.1	46.55	13	36.8	19	19.61	6	50.6	2	33.47	6	25.4	3	49.76	22	62.3	26
Sept. 7.1	46.46	9	34.7	21	19.57	4	50.5	1	33.43	4	24.8	6	49.60	16	59.4	29
17.0	46.42	4	32.5	22	19.56	1	50.6	1	33.42	1	24.0	8	49.49	11	56.2	32
27.0	46.43	1	30.3	22	19.59	3	51.0	4	33.44	2	23.0	10	49.45	4	52.7	35
Oct. 7.0	46.50	7	28.3	20	19.65	6	51.5	5	33.50	6	21.7	13	49.48	3	49.1	36
17.0	46.64	14	26.4	19	19.75	10	52.4	9	33.60	10	20.2	15	49.59	11	45.3	38
26.9	46.84	20	24.8	16	19.90	15	53.5	11	33.75	15	18.4	18	49.78	19	41.6	37
Nov. 5.9	47.10	26	23.6	12	20.08	18	54.8	13	33.94	19	16.5	19	50.05	27	37.9	37
15.9	47.43	33	22.8	8	20.31	23	56.4	16	34.16	22	14.3	22	50.40	35	34.4	35
25.8	47.81	38	22.6	2	20.58	27	58.2	18	34.43	27	12.0	23	50.83	43	31.1	33
Dec. 5.8	48.23	42	22.8	2	20.89	31	60.2	20	34.74	31	9.7	23	51.32	49	28.2	29
15.8	48.68	45	23.6	8	21.22	33	62.4	22	35.06	32	7.3	24	51.87	55	25.7	25
25.8	49.14	46	24.9	13	21.55	33	64.6	22	35.40	34	5.0	23	52.45	58	23.8	19
35.7	49.60	46	26.6	17	21.89	34	66.8	22	35.75	35	2.8	22	53.05	60	22.3	15
Sec δ, Tan δ	1.509		−1.130		1.000		−0.017		1.018		+0.189		2.217		+1.978	
Mean Place	$46^s.068$		15″.66		$18^s.170$		40″.29		$31^s.937$		33″.53		$48^s.758$		66″.26	
$D'_\psi a$, $D_\omega a$	0.00		−0.07		0.00		0.00		0.00		+0.01		−0.01		+0.13	
$D_\psi \delta$, $D_\omega \delta$	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Crucis. Mag. 1.5				31 Comæ. Mag. 5.1				32 H. Camelop. *seq.* Mag. 5.3				η Centauri. Mag. 4.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 42		−59 12		12 47		+27 59		12 48		+83 52		12 48		−39 42	
	s		″		s		″		s		″		s		″	
Jan. 0.8	40.48	56	54.2	18	31.09	36	76.4	19	33.64	216	25.5	6	39.84	41	32.2	21
10.7	41.04	54	56.0	23	31.45	36	74.5	15	35.80	213	24.9	0	40.25	39	34.3	23
20.7	41.58	49	58.3	26	31.81	34	73.0	10	37.93	204	24.9	6	40.64	37	36.6	25
30.7	42.07	45	60.9	30	32.15	30	72.0	6	39.97	187	25.5	13	41.01	34	39.1	27
Feb. 9.6	42.52	38	63.9	32	32.45	27	71.4	1	41.84	163	26.8	19	41.35	29	41.8	28
19.6	42.90	32	67.1	33	32.72	23	71.3	4	43.47	134	28.7	23	41.64	25	44.6	28
Mar. 1.6	43.22	26	70.4	34	32.95	18	71.7	7	44.81	100	31.0	27	41.89	20	47.4	28
11.6	43.48	19	73.8	34	33.13	14	72.4	11	45.81	62	33.7	29	42.09	16	50.2	27
21.5	43.67	13	77.2	34	33.27	9	73.5	13	46.43	23	36.6	31	42.25	11	52.9	25
31.5	43.80	6	80.6	32	33.36	5	74.8	16	46.66	14	39.7	31	42.36	7	55.4	24
Apr. 10.5	43.86	1	83.8	31	33.41	1	76.4	16	46.52	51	42.8	29	42.43	3	57.8	21
20.5	43.87	5	86.9	27	33.42	1	78.0	17	46.01	85	45.7	27	42.46	0	59.9	19
30.4	43.82	10	89.6	25	33.41	5	79.7	17	45.16	115	48.4	24	42.46	3	61.8	17
May 10.4	43.72	14	92.1	22	33.36	7	81.4	15	44.01	141	50.8	20	42.43	6	63.5	13
20.4	43.58	19	94.3	17	33.29	9	82.9	14	42.60	162	52.8	16	42.37	9	64.8	10
30.3	43.39	22	96.0	13	33.20	10	84.3	12	40.98	176	54.4	10	42.28	11	65.8	7
June 9.3	43.17	24	97.3	9	33.10	12	85.5	9	39.22	187	55.4	5	42.17	12	66.5	4
19.3	42.93	27	98.2	4	32.98	12	86.4	7	37.35	191	55.9	1	42.05	14	66.9	0
29.3	42.66	28	98.6	0	32.86	12	87.1	4	35.44	192	55.8	7	41.91	15	66.9	3
July 9.2	42.38	29	98.6	5	32.74	13	87.5	1	33.52	186	55.1	12	41.76	16	66.6	6
19.2	42.09	28	98.1	10	32.61	12	87.6	2	31.66	177	53.9	17	41.60	15	66.0	10
29.2	41.81	27	97.1	14	32.49	12	87.4	5	29.89	164	52.2	22	41.45	15	65.0	12
Aug. 8.2	41.54	23	95.7	17	32.37	10	86.9	9	28.25	147	50.0	26	41.30	13	63.8	14
18.1	41.31	20	94.0	21	32.27	8	86.0	11	26.78	127	47.4	30	41.17	11	62.4	17
28.1	41.11	15	91.9	23	32.19	6	84.9	14	25.51	104	44.4	34	41.06	8	60.7	17
Sept. 7.1	40.96	9	89.6	25	32.13	3	83.5	17	24.47	78	41.0	36	40.98	4	59.0	18
17.0	40.87	1	87.1	25	32.10	0	81.8	20	23.69	50	37.4	38	40.94	0	57.2	18
27.0	40.86	6	84.6	25	32.10	4	79.8	23	23.19	21	33.6	39	40.94	6	55.4	17
Oct. 7.0	40.92	15	82.1	23	32.14	9	77.5	24	22.98	11	29.7	39	41.00	11	53.7	14
17.0	41.07	23	79.8	21	32.23	13	75.1	27	23.09	43	25.8	39	41.11	17	52.3	12
26.9	41.30	32	77.7	17	32.36	19	72.4	27	23.52	75	21.9	37	41.28	23	51.1	8
Nov. 5.9	41.62	39	76.0	13	32.55	23	69.7	29	24.27	106	18.2	35	41.51	28	50.3	5
15.9	42.01	46	74.7	8	32.78	27	66.8	28	25.33	136	14.7	32	41.79	33	49.8	0
25.9	42.47	51	73.9	2	33.05	31	64.0	28	26.69	162	11.5	27	42.12	36	49.8	5
Dec. 5.8	42.98	55	73.7	4	33.36	33	61.2	26	28.31	184	8.8	23	42.48	40	50.3	10
15.8	43.53	57	74.1	9	33.69	36	58.6	24	30.15	201	6.5	17	42.88	42	51.3	13
25.8	44.10	56	75.0	14	34.05	37	56.2	21	32.16	210	4.8	10	43.30	41	52.6	18
35.7	44.66		76.4		34.42		54.1		34.26		3.8		43.71		54.4	
Sec δ, Tan δ	1.954		−1.679		1.133		+0.532		9.372		+9.319		1.300		−0.831	
Mean Place	41ˢ.198		67″.95		30ˢ.635		90″.44		29ˢ.098		49″.22		40ˢ.122		40″.88	
D′ψ a, Dω a	+0.01		−0.11		0.00		+0.03		−0.05		+0.61		0.00		−0.05	
Dψ δ, Dω δ	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ε Ursæ Majoris.**				**δ Virginis.**				**α Can. Ven.** *seq.*				**δ Muscæ.**			
	Mag. 1.7				Mag. 3.7				Mag. 2.9				Mag. 3.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 50		+56 24		12 51		+ 3 51		12 52		+38 46		12 56		−71 4	
	s		″		s		″		s		″		s		″	
Jan. 0.8	15.88		74.1		16.44		46.4		0.97		40.1		18.42		51.5	
10.7	16.40	52	72.7	14	16.78	34	44.3	21	1.37	40	38.4	17	19.24	82	52.9	14
20.7	16.90	50	72.0	7	17.11	33	42.3	20	1.76	39	37.2	12	20.04	80	54.8	19
30.7	17.38	48	71.9	1	17.42	31	40.5	18	2.13	37	36.5	7	20.79	75	57.2	24
Feb. 9.6	17.82	44	72.4	5	17.70	28	39.0	15	2.47	34	36.3	2	21.47	68	60.0	28
19.6	18.20	38	73.4	10	17.95	25	37.8	12	2.77	30	36.7	4	22.07	60	63.1	31
Mar. 1.6	18.52	32	75.0	16	18.16	21	36.9	9	3.02	25	37.5	8	22.58	51	66.5	34
11.6	18.77	25	77.0	20	18.33	17	36.3	6	3.22	20	38.8	13	22.99	41	70.0	35
21.5	18.95	18	79.4	24	18.46	13	36.0	3	3.36	14	40.4	16	23.30	31	73.7	37
31.5	19.06	11	81.9	25	18.56	10	36.0	0	3.46	10	42.3	19	23.51	21	77.4	37
Apr. 10.5	19.09	3	84.6	27	18.62	6	36.2	2	3.51	5	44.3	20	23.63	12	81.0	36
20.5	19.06	3	87.3	27	18.65	3	36.6	4	3.52	1	46.5	22	23.65	2	84.4	34
30.4	18.98	8	89.9	26	18.66	1	37.1	5	3.49	3	48.6	21	23.57	8	87.6	32
May 10.4	18.84	14	92.3	24	18.64	2	37.7	6	3.42	7	50.6	20	23.41	16	90.6	30
20.4	18.66	18	94.4	21	18.60	4	38.4	7	3.33	9	52.5	19	23.17	24	93.3	27
30.3	18.44	22	96.1	17	18.54	6	39.1	7	3.22	11	54.1	16	22.86	31	95.5	22
June 9.3	18.20	24	97.5	14	18.47	7	39.8	7	3.08	14	55.4	13	22.48	38	97.4	19
19.3	17.94	26	98.4	9	18.39	8	40.5	7	2.93	15	56.4	10	22.05	43	98.7	13
29.3	17.66	28	98.8	4	18.30	9	41.1	6	2.78	15	57.1	7	21.58	47	99.6	9
July 9.2	17.39	27	98.8	0	18.20	10	41.7	6	2.62	16	57.4	3	21.08	50	100.0	4
19.2	17.12	27	98.3	5	18.11	9	42.2	5	2.46	16	57.3	1	20.57	51	99.8	2
29.2	16.86	26	97.3	10	18.01	10	42.6	4	2.30	16	56.8	5	20.06	51	99.1	7
Aug. 8.2	16.62	24	95.9	14	17.92	9	42.8	2	2.16	14	56.0	8	19.57	49	97.9	12
18.1	16.40	22	94.0	19	17.83	9	43.0	2	2.03	13	54.7	13	19.13	44	96.3	16
28.1	16.22	18	91.7	23	17.76	7	43.0	0	1.92	11	53.2	15	18.74	39	94.2	21
Sept. 7.1	16.08	14	89.1	26	17.71	5	42.8	2	1.83	9	51.2	20	18.44	30	91.8	24
17.0	15.98	10	86.1	30	17.69	2	42.4	4	1.78	5	49.0	22	18.24	20	89.2	26
27.0	15.94	4	82.9	32	17.70	1	41.8	6	1.77	1	46.5	25	18.15	9	86.4	28
Oct. 7.0	15.95	1	79.5	34	17.75	5	40.9	9	1.80	3	43.8	27	18.18	3	83.6	28
17.0	16.03	8	75.9	36	17.84	9	39.8	11	1.88	8	40.8	30	18.34	16	80.8	28
26.9	16.18	15	72.3	36	17.97	13	38.5	13	2.01	13	37.7	31	18.63	29	78.3	25
Nov. 5.9	16.40	22	68.6	37	18.14	17	36.9	16	2.19	18	34.5	32	19.05	42	76.1	22
15.9	16.68	28	65.1	35	18.36	22	35.0	19	2.42	23	31.3	32	19.59	54	74.2	19
25.9	17.03	35	61.8	33	18.62	26	33.0	20	2.71	29	28.2	31	20.24	65	72.9	13
Dec. 5.8	17.44	41	58.7	31	18.91	29	30.9	21	3.04	33	25.3	29	20.97	73	72.1	8
15.8	17.90	46	56.0	27	19.23	32	28.6	23	3.40	36	22.6	27	21.76	79	71.8	3
25.8	18.39	49	53.8	22	19.56	33	26.4	22	3.78	38	20.2	24	22.59	83	72.2	4
35.7	18.89	50	52.1	17	19.90	34	24.2	22	4.18	40	18.2	20	23.43	84	73.2	10
Sec δ, Tan δ	1.808		+1.506		1.002		+0.068		1.283		+0.804		3.085		−2.919	
Mean Place	14^{s}.992		95″.19		16^{s}.246		52″.61		0^{s}.425		57″.43		20^{s}.036		66″.75	
$D'_\psi a$, $D_\omega a$	−0.01		+0.10		0.00		0.00		0.00		+0.05		+0.02		−0.19	
$D_\psi \delta$, $D_\omega \delta$	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Virginis. Mag. 3.0				θ Virginis. Mag. 4.4				43 Comae. Mag. 4.3				20 Canum Venat. Mag. 4.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 12 57		° ′ +11 24		h m 13 5		° ′ − 5 4		h m 13 7		° ′ +28 18		h m 13 13		° ′ +41 0	
	s		″		s		″		s		″		s		″	
Jan. 0.8	53.97		67.1		29.75		52.0		52.02		35.1		41.75		72.2	
10.7	54.32	35	65.0	21	30.09	34	54.1	21	52.38	36	33.1	20	42.16	41	70.3	19
20.7	54.65	33	63.1	19	30.43	34	56.2	21	52.74	36	31.6	15	42.56	40	68.9	14
30.7	54.97	32	61.6	15	30.74	31	58.2	20	53.08	34	30.4	12	42.94	38	68.1	8
Feb. 9.7	55.26	29	60.3	13	31.03	29	60.0	18	53.40	32	29.8	6	43.30	36	67.8	3
19.6	55.51	25	59.4	9	31.29	26	61.5	15	53.68	28	29.6	2	43.62	32	68.2	4
Mar. 1.6	55.73	22	58.9	5	31.52	23	62.9	14	53.92	24	30.0	4	43.89	27	69.0	8
11.6	55.91	18	58.8	1	31.70	18	64.0	11	54.12	20	30.7	7	44.12	23	70.2	12
21.5	56.05	14	58.9	1	31.85	15	64.8	8	54.28	16	31.8	11	44.30	18	71.9	17
31.5	56.15	10	59.3	4	31.97	12	65.4	6	54.39	11	33.1	13	44.42	12	73.8	19
Apr. 10.5	56.22	7	59.9	6	32.05	8	65.7	3	54.46	7	34.7	16	44.50	8	76.0	22
20.5	56.26	4	60.7	8	32.10	5	65.8	1	54.50	4	36.5	18	44.53	3	78.2	22
30.4	56.27	1	61.7	10	32.12	2	65.8	0	54.50	0	38.3	18	44.52	1	80.5	23
May 10.4	56.25	2	62.7	10	32.12	0	65.6	2	54.47	3	40.0	17	44.47	5	82.8	23
20.4	56.21	4	63.7	10	32.09	3	65.3	3	54.41	6	41.7	17	44.39	8	84.8	20
30.4	56.15	6	64.7	10	32.05	4	64.9	4	54.33	8	43.3	16	44.28	11	86.6	18
June 9.3	56.08	7	65.6	9	31.99	6	64.5	4	54.24	9	44.6	13	44.15	13	88.2	16
19.3	55.99	9	66.5	9	31.92	7	63.9	6	54.13	11	45.8	12	44.00	15	89.4	12
29.3	55.90	9	67.2	7	31.83	9	63.4	5	54.01	12	46.6	8	43.84	16	90.3	9
July 9.2	55.80	10	67.8	6	31.74	9	62.8	6	53.88	13	47.2	6	43.67	17	90.7	4
19.2	55.69	11	68.2	4	31.64	10	62.2	6	53.74	14	47.4	2	43.49	18	90.8	1
29.2	55.59	10	68.4	2	31.54	10	61.7	5	53.61	13	47.4	0	43.31	18	90.4	4
Aug. 8.2	55.49	10	68.5	1	31.44	10	61.2	5	53.48	13	47.0	4	43.14	17	89.7	7
18.1	55.40	9	68.4	1	31.35	9	60.7	5	53.36	12	46.2	8	42.99	15	88.5	12
28.1	55.32	8	68.0	4	31.27	8	60.4	3	53.26	10	45.2	10	42.85	14	87.0	15
Sept. 7.1	55.26	6	67.4	6	31.21	6	60.1	3	53.17	9	43.9	13	42.73	12	85.1	19
17.1	55.23	3	66.6	8	31.17	4	60.0	1	53.12	5	42.2	17	42.65	8	82.9	22
27.0	55.24	1	65.6	10	31.17	0	60.1	1	53.10	2	40.3	19	42.60	5	80.4	25
Oct. 7.0	55.27	3	64.3	13	31.21	4	60.4	3	53.11	1	38.1	22	42.60	0	77.6	28
17.0	55.35	8	62.7	16	31.28	7	60.9	5	53.17	6	35.7	24	42.65	5	74.5	31
26.9	55.48	13	61.0	17	31.40	12	61.7	8	53.28	11	33.1	26	42.75	10	71.3	32
Nov. 5.9	55.64	16	59.0	20	31.57	17	62.8	11	53.44	16	30.3	28	42.91	16	68.0	33
15.9	55.85	21	56.8	22	31.78	21	64.1	13	53.64	20	27.4	29	43.12	21	64.7	33
25.9	56.11	26	54.5	23	32.03	25	65.7	16	53.89	25	24.5	29	43.38	26	61.5	32
Dec. 5.8	56.40	29	52.1	24	32.32	29	67.5	18	54.18	29	21.7	28	43.69	31	58.4	31
15.8	56.71	31	49.7	24	32.64	32	69.5	20	54.51	33	19.0	27	44.04	35	55.5	29
25.8	57.05	34	47.4	23	32.97	33	71.6	21	54.86	35	16.5	25	44.42	38	52.9	26
35.8	57.39	34	45.2	22	33.32	35	73.7	21	55.22	36	14.3	22	44.82	40	50.8	21
Sec δ, Tan δ	1.020		+0.202		1.004		−0.089		1.136		+0.538		1.325		+0.870	
Mean Place	$53^{\mathrm{s}}.754$		$76''.14$		$29^{\mathrm{s}}.725$		$48''.45$		$51^{\mathrm{s}}.711$		$49''.92$		$41^{\mathrm{s}}.361$		$90''.61$	
$D'_{\psi}a$, $D_{\omega}a$	0.00		+0.01		0.00		−0.01		0.00		+0.03		−0.01		+0.06	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		−0.2		−0.4		−0.3		−0.4		−0.3		−0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Hydræ. Mag. 3.3				ι Centauri. Mag. 2.9				ζ¹ Ursæ Majoris. Mag. 2.4				α Virginis. Mag. 1.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	13 14		−22 43		13 15		−36 15		13 20		+55 21		13 20		−10 42	
	s		″		s		″		s		″		s		″	
Jan. 0.8	14.37	36	2.7	20	44.97	41	25.7	18	28.49	49	65.6	18	39.51	34	47.7	21
10.7	14.73	36	4.7	22	45.38	39	27.5	21	28.98	49	63.8	11	39.85	34	49.8	21
20.7	15.09	34	6.9	22	45.77	37	29.6	23	29.47	48	62.7	5	40.19	33	51.9	20
30.7	15.43	31	9.1	22	46.14	35	31.9	24	29.95	45	62.2	2	40.52	30	53.9	19
Feb. 9.7	15.74	28	11.3	22	46.49	30	34.3	25	30.40	40	62.4	7	40.82	27	55.8	18
19.6	16.02	24	13.5	21	46.79	27	36.8	26	30.80	35	63.1	13	41.09	24	57.6	16
Mar. 1.6	16.26	21	15.6	19	47.06	23	39.4	25	31.15	29	64.4	18	41.33	20	59.2	13
11.6	16.47	17	17.5	18	47.29	19	41.9	25	31.44	22	66.2	22	41.53	17	60.5	11
21.6	16.64	13	19.3	16	47.48	14	44.4	23	31.66	16	68.4	25	41.70	13	61.6	9
31.5	16.77	9	20.9	13	47.62	11	46.7	21	31.82	8	70.9	27	41.83	10	62.5	7
Apr. 10.5	16.86	7	22.2	12	47.73	7	48.8	20	31.90	2	73.6	27	41.93	7	63.2	4
20.5	16.93	3	23.4	10	47.80	3	50.8	17	31.92	3	76.3	27	42.00	3	63.6	3
30.4	16.96	1	24.4	8	47.83	0	52.5	15	31.89	10	79.0	26	42.03	2	63.9	1
May 10.4	16.97	2	25.2	6	47.83	3	54.0	13	31.79	14	81.6	23	42.05	1	64.0	0
20.4	16.95	4	25.8	4	47.80	5	55.3	10	31.65	18	83.9	21	42.04	4	64.0	2
30.4	16.91	6	26.2	2	47.75	8	56.3	7	31.47	21	86.0	17	42.00	5	63.8	2
June 9.3	16.85	8	26.4	1	47.67	10	57.0	5	31.26	24	87.7	12	41.95	7	63.6	4
19.3	16.77	9	26.3	1	47.57	12	57.5	1	31.02	26	88.9	9	41.88	8	63.2	4
29.3	16.68	10	26.2	4	47.45	13	57.6	2	30.76	27	89.8	3	41.80	9	62.8	6
July 9.3	16.58	12	25.8	6	47.32	15	57.4	4	30.49	27	90.1	1	41.71	10	62.2	5
19.2	16.46	12	25.2	7	47.17	14	57.0	7	30.22	28	90.0	6	41.61	11	61.7	6
29.2	16.34	11	24.5	8	47.03	15	56.3	10	29.94	26	89.4	11	41.50	11	61.1	6
Aug. 8.2	16.23	11	23.7	9	46.88	14	55.3	12	29.68	24	88.3	16	41.39	10	60.5	6
18.1	16.12	10	22.8	10	46.74	12	54.1	14	29.44	22	86.7	20	41.29	9	59.9	6
28.1	16.02	8	21.8	11	46.62	10	52.7	15	29.22	19	84 7	24	41.20	7	59.3	5
Sept. 7.1	15.94	4	20.7	9	46.52	7	51.2	16	29.03	15	82.3	27	41.13	5	58.8	4
17.1	15.90	2	19.8	9	46.45	2	49.6	15	28.88	9	79.6	30	41.08	2	58.4	2
27.0	15.88	3	18.9	8	46.43	2	48.1	15	28.79	5	76.6	34	41.06	2	58.2	0
Oct. 7.0	15.91	7	18.1	5	46.45	8	46.6	13	28.74	2	73.2	35	41.08	6	58.2	1
17.0	15.98	12	17.6	3	46.53	13	45.3	11	28.76	9	69.7	36	41.14	11	58.3	5
27.0	16.10	18	17.3	0	46.66	19	44.2	8	28.85	16	66.1	37	41.25	16	58.8	7
Nov. 5.9	16.28	22	17.3	3	46.85	24	43.4	4	29.01	23	62.4	36	41.41	20	59.5	9
15.9	16.50	27	17.6	7	47.09	30	43.0	0	29.24	30	58.8	36	41.61	25	60.4	13
25.9	16.77	30	18.3	10	47.39	34	43.0	4	29.54	36	55.2	33	41.86	28	61.7	15
Dec. 5.8	17.07	34	19.3	14	47.73	37	43.4	8	29.90	41	51.9	29	42.14	32	63.2	18
15.8	17.41	35	20.7	16	48.10	39	44.2	12	30.31	46	49.0	26	42.46	33	65.0	19
25.8	17.76	37	22.3	19	48.49	40	45.4	16	30.77	48	46.4	20	42.79	35	66.9	20
35.8	18.13		24.2		48.89		47.0		31.25		44.4		43.14		68.9	
Sec δ, Tan δ	1.084		−0.419		1.240		−0.733		1.760		+1.448		1.018		−0.189	
Mean Place	14ˢ.571		5″.04		45ˢ.380		32″.24		27ˢ.983		87″.23		39ˢ.619		45″.65	
D′ψ a, Dω a	0.00		−0.03		+0.01		−0.05		−0.01		+0.09		0.00		−0.01	
Dψ δ, Dω δ	−0.4		−0.3		−0.4		−0.3		−0.4		−0.3		−0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2001. Mag. 6.1				70 Virginis. Mag. 5.2				κ Octantis. Mag. 5.6				ζ Virginis. Mag. 3.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 13 23		° ′ +72 49		h m 13 24		° ′ +14 13		h m 13 26		° ′ −85 20		h m 13 30		° ′ − 0 9	
	s		″		s		″		s		″		s		″	
Jan. 0.8	57.23	83	52.1	14	13.50	35	65.3	22	38.09	303	31.1	6	18.50	34	29.4	22
10.8	58.06	84	50.7	7	13.85	34	63.1	19	41.12	299	31.7	11	18.84	33	31.6	20
20.7	58.90	83	50.0	1	14.19	33	61.2	16	44.11	287	32.8	17	19.17	33	33.6	18
30.7	59.73	77	49.9	6	14.52	30	59.6	12	46.98	268	34.5	23	19.50	30	35.4	16
Feb. 9.7	60.50	71	50.5	12	14.82	27	58.4	9	49.66	244	36.8	27	19.80	27	37.0	14
19.6	61.21	61	51.7	17	15.09	24	57.5	4	52.10	215	39.5	31	20.07	24	38.4	12
Mar. 1.6	61.82	50	53.4	23	15.33	21	57.1	1	54.25	181	42.6	34	20.31	21	39.6	8
11.6	62.32	37	55.7	26	15.54	16	57.0	3	56.06	144	46.0	36	20.52	17	40.4	5
21.6	62.69	23	58.3	29	15.70	13	57.3	5	57.50	107	49.6	37	20.69	14	40.9	2
31.5	62.92	10	61.2	30	15.83	10	57.8	9	58.57	67	53.3	38	20.83	10	41.1	0
Apr. 10.5	63.02	3	64.2	31	15.93	6	58.7	10	59.24	26	57.1	38	20.93	7	41.1	2
20.5	62.99	15	67.3	30	15.99	3	59.7	11	59.50	13	60.9	36	21.00	4	40.9	3
30.5	62.84	27	70.3	27	16.02	0	60.8	12	59.37	52	64.5	35	21.04	2	40.6	5
May 10.4	62.57	37	73.0	24	16.02	2	62.0	12	58.85	90	68.0	33	21.06	0	40.1	6
20.4	62.20	45	75.4	21	16.00	5	63.2	12	57.95	125	71.3	29	21.06	3	39.5	6
30.4	61.75	52	77.5	16	15.95	6	64.4	10	56.70	156	74.2	25	21.03	5	38.9	7
June 9.3	61.23	58	79.1	12	15.89	8	65.4	10	55.14	184	76.7	21	20.98	6	38.2	6
19.3	60.65	61	80.3	6	15.81	9	66.4	8	53.30	207	78.8	16	20.92	8	37.6	7
29.3	60.04	64	80.9	1	15.72	10	67.2	7	51.23	224	80.4	11	20.84	10	36.9	6
July 9.3	59.40	64	81.0	5	15.62	11	67.9	5	48.99	234	81.5	5	20.74	10	36.3	6
19.2	58.76	63	80.5	10	15.51	12	68.4	2	46.65	237	82.0	1	20.64	10	35.7	5
29.2	58.13	60	79.5	15	15.39	11	68.6	1	44.28	232	81.9	6	20.54	11	35.2	4
Aug. 8.2	57.53	56	78.0	20	15.28	11	68.7	2	41.96	219	81.3	12	20.43	11	34.8	3
18.2	56.97	51	76.0	24	15.17	10	68.5	4	39.77	197	80.1	17	20.32	9	34.5	1
28.1	56.46	44	73.6	28	15.07	8	68.1	7	37.80	168	78.4	22	20.23	8	34.4	1
Sept. 7.1	56.02	36	70.8	32	14.99	6	67.4	9	36.12	132	76.2	25	20.15	5	34.3	2
17.1	55.66	27	67.6	35	14.93	2	66.5	12	34.80	89	73.7	28	20.10	3	34.5	3
27.0	55.39	16	64.1	37	14.91	1	65.3	14	33.91	41	70.9	30	20.07	1	34.8	6
Oct. 7.0	55.23	5	60.4	38	14.92	4	63.9	17	33.50	10	67.9	31	20.08	4	35.4	8
17.0	55.18	7	56.6	39	14.96	10	62.2	19	33.60	62	64.8	30	20.12	10	36.2	11
27.0	55.25	20	52.7	39	15.06	14	60.3	22	34.22	113	61.8	28	20.22	14	37.3	13
Nov. 5.9	55.45	33	48.8	38	15.20	18	58.1	23	35.35	161	59.0	25	20.36	19	38.6	15
15.9	55.78	45	45.0	36	15.38	24	55.8	24	36.96	205	56.5	21	20.55	23	40.1	17
25.9	56.23	56	41.4	32	15.62	27	53.4	25	39.01	242	54.4	16	20.78	26	41.8	20
Dec. 5.9	56.79	67	38.2	29	15.89	30	50.9	25	41.43	271	52.8	11	21.04	30	43.8	20
15.8	57.46	74	35.3	23	16.19	33	48.4	25	44.14	292	51.7	4	21.34	33	45.8	21
25.8	58.20	80	33.0	18	16.52	34	45.9	23	47.06	302	51.3	1	21.67	33	47.9	22
35.8	59.00		31.2		16.86		43.6		50.08		51.4		22.00		50.1	
Sec δ, Tan δ	3.388		+3.237		1.032		+0.254		12.333		−12.292		1.000		−0.003	
Mean Place	$56^{s}.342$		76″.10		$13^{s}.425$		76″.10		$47^{s}.35$*		46″.30		$18^{s}.571$		23″.36	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.03		+0.20		0.00		+0.02		+0.12		−0.76		0.00		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	17 H. Canum Venat. Mag. 5.0				ε Centauri. Mag. 2.6				*m* Virginis. Mag. 5.2				τ Boötis. Mag. 4.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 13 30		° ′ +37 36		h m 13 34		° ′ −53 1		h m 13 37		° ′ − 8 16		h m 13 43		° ′ +17 52	
	s		″		s		″		s		″		s		″	
Jan. 0.8	57.74		64.1		24.84		36.5		5.58		13.3		10.50		53.4	
10.8	58.12	38	62.0	21	25.35	51	37.8	13	5.93	35	15.4	21	10.84	34	51.2	22
20.7	58.51	39	60.4	16	25.85	50	39.5	17	6.27	34	17.4	20	11.19	35	49.3	19
30.7	58.89	38	59.4	10	26.33	48	41.6	21	6.60	33	19.4	20	11.52	33	47.7	16
Feb. 9.7	59.24	35	58.8	6	26.78	45	44.0	24	6.90	30	21.2	18	11.84	32	46.5	12
19.7	59.56	32	58.9	1	27.19	41	46.6	26	7.18	28	22.8	16	12.13	29	45.8	7
Mar. 1.6	59.84	28	59.4	5	27.56	37	49.4	28	7.43	25	24.2	14	12.38	25	45.4	4
11.6	60.08	24	60.5	11	27.87	31	52.3	29	7.65	22	25.4	12	12.60	22	45.5	1
21.6	60.27	19	61.9	14	28.13	26	55.3	30	7.83	18	26.4	10	12.79	19	46.0	5
31.5	60.42	15	63.7	18	28.34	21	58.3	30	7.98	15	27.1	7	12.94	15	46.8	8
Apr. 10.5	60.52	10	65.7	20	28.50	16	61.2	29	8.09	11	27.6	5	13.05	11	47.8	10
20.5	60.57	5	67.9	22	28.61	11	63.9	27	8.17	8	27.9	3	13.12	7	49.0	12
30.5	60.59	2	70.1	22	28.67	6	66.5	26	8.22	5	28.0	1	13.17	5	50.4	14
May 10.4	60.57	2	72.3	22	28.68	1	68.9	24	8.25	3	27.9	1	13.18	1	51.9	15
20.4	60.51	6	74.4	21	28.65	3	71.1	22	8.25	0	27.8	1	13.17	1	53.3	14
30.4	60.42	9	76.3	19	28.57	8	72.9	18	8.23	2	27.5	3	13.14	3	54.7	14
June 9.4	60.32	10	77.9	16	28.46	11	74.4	15	8.19	4	27.1	4	13.08	6	56.0	13
19.3	60.19	13	79.3	14	28.31	15	75.5	11	8.13	6	26.7	4	13.00	8	57.2	12
29.3	60.04	15	80.3	10	28.14	17	76.3	8	8.06	7	26.2	5	12.91	9	58.1	9
July 9.3	59.88	16	81.0	7	27.93	21	76.7	4	7.97	9	25.7	5	12.80	11	58.9	8
19.2	59.72	16	81.2	2	27.71	22	76.6	1	7.87	10	25.1	6	12.69	11	59.5	6
29.2	59.55	17	81.1	1	27.48	23	76.2	4	7.76	11	24.6	5	12.56	13	59.8	3
Aug. 8.2	59.38	17	80.6	5	27.24	24	75.3	9	7.65	11	24.0	6	12.44	12	59.8	0
18.2	59.22	16	79.7	9	27.02	22	74.1	12	7.54	11	23.5	5	12.32	12	59.6	2
28.1	59.08	14	78.4	13	26.82	20	72.5	16	7.44	10	23.0	5	12.20	12	59.2	4
Sept. 7.1	58.96	12	76.8	16	26.64	18	70.7	18	7.36	8	22.7	3	12.10	10	58.4	8
17.1	58.86	10	74.8	20	26.51	13	68.7	20	7.30	6	22.4	3	12.02	8	57.4	10
27.1	58.80	6	72.5	23	26.43	8	66.5	22	7.26	4	22.3	1	11.97	5	56.1	13
Oct. 7.0	58.78	2	69.9	26	26.42	1	64.3	22	7.26	0	22.4	1	11.96	1	54.5	16
17.0	58.80	2	67.0	29	26.47	5	62.2	21	7.31	5	22.7	3	11.99	3	52.7	18
27.0	58.88	8	64.0	30	26.60	13	60.2	20	7.40	9	23.3	6	12.06	7	50.6	21
Nov. 5.9	59.02	14	60.8	32	26.81	21	58.4	18	7.54	14	24.1	8	12.18	12	48.3	23
15.9	59.20	18	57.5	33	27.09	28	57.0	14	7.73	19	25.2	11	12.34	16	45.8	25
25.9	59.44	24	54.3	32	27.44	35	56.0	10	7.96	23	26.5	13	12.56	22	43.2	26
Dec. 5.9	59.73	29	51.2	31	27.85	41	55.5	5	8.23	27	28.1	16	12.81	25	40.6	26
15.8	60.05	32	48.2	30	28.31	46	55.5	0	8.53	30	29.9	18	13.10	29	38.0	26
25.8	60.41	36	45.5	27	28.79	48	55.9	4	8.86	33	31.8	19	13.42	32	35.4	26
35.8	60.79	38	43.2	23	29.30	51	56.8	9	9.20	34	33.8	20	13.76	34	33.1	23
Sec δ, Tan δ	1.262		+0.771		1.663		−1.329		1.010		−0.145		1.051		+0.323	
Mean Place	$57^{s}.527$		$82''.01$		$25^{s}.787$		$46''.70$		$5^{s}.765$		$9''.85$		$10^{s}.518$		$65''.85$	
D′ψ α, Dω α	−0.01		+0.05		+0.01		−0.08		0.00		−0.01		0.00		+0.02	
Dψ δ, Dω δ	−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**η Ursæ Majoris.** Mag. 1.9				**89 Virginis.** Mag. 5.1				**ζ Centauri.** Mag. 3.1				**η Boötis.** Mag. 2.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 13 44		° ′ +49 43		h m 13 45		° ′ −17 42		h m 13 50		° ′ −46 51		h m 13 50		° ′ +18 49	
	s		″		s		″		s		″		s		″	
Jan. 0.8	9.41		70.7		11.40		22.6		9.19		48.0		35.34		29.4	
10.8	9.85	44	68.6	21	11.76	36	24.5	19	9.64	45	49.2	12	35.68	34	27.2	22
20.7	10.30	45	67.2	14	12.11	35	26.5	20	10.10	46	50.8	16	36.03	35	25.2	20
30.7	10.73	43	66.3	9	12.45	34	28.5	20	10.54	44	52.7	19	36.36	33	23.6	16
Feb. 9.7	11.15	42	66.0	3	12.77	32	30.5	20	10.96	42	54.9	22	36.68	32	22.4	12
19.7	11.53	38	66.3	3	13.06	29	32.4	19	11.35	39	57.3	24	36.98	30	21.7	7
Mar. 1.6	11.87	34	67.3	10	13.33	27	34.2	18	11.70	35	59.9	26	37.24	26	21.3	4
11.6	12.16	29	68.7	14	13.56	23	35.8	16	12.00	30	62.5	26	37.47	23	21.4	1
21.6	12.40	24	70.6	19	13.75	19	37.2	14	12.26	26	65.2	27	37.66	19	21.9	5
31.6	12.57	17	72.8	22	13.91	16	38.4	12	12.47	21	67.9	27	37.82	16	22.7	8
Apr. 10.5	12.69	12	75.3	25	14.04	13	39.4	10	12.64	17	70.4	25	37.94	12	23.8	11
20.5	12.75	6	77.9	26	14.13	9	40.3	9	12.77	13	72.9	25	38.02	8	25.1	13
30.5	12.76	1	80.6	27	14.20	7	41.0	7	12.86	9	75.2	23	38.07	5	26.5	14
May 10.4	12.72	4	83.2	26	14.24	4	41.5	5	12.90	4	77.3	21	38.10	3	28.0	15
20.4	12.64	8	85.6	24	14.25	1	41.8	3	12.90	0	79.2	19	38.09	1	29.6	16
30.4	12.51	13	87.8	22	14.24	1	42.0	2	12.86	4	80.8	16	38.06	3	31.0	14
June 9.4	12.36	15	89.7	19	14.20	4	42.0	0	12.79	7	82.1	13	38.01	5	32.4	14
19.3	12.17	19	91.3	16	14.14	6	41.9	1	12.69	10	83.2	11	37.93	8	33.6	12
29.3	11.97	20	92.4	11	14.07	7	41.6	3	12.56	13	83.9	7	37.84	9	34.6	10
July 9.3	11.74	23	93.1	7	13.97	10	41.3	3	12.40	16	84.2	3	37.74	10	35.4	8
19.3	11.51	23	93.3	2	13.87	10	40.8	5	12.22	18	84.2	0	37.62	12	36.0	6
29.2	11.27	24	93.1	2	13.75	12	40.3	5	12.03	19	83.8	4	37.49	13	36.3	3
Aug. 8.2	11.04	23	92.4	7	13.63	12	39.6	7	11.83	20	83.1	7	37.36	13	36.4	1
18.2	10.81	23	91.3	11	13.52	11	38.9	7	11.63	20	82.0	11	37.24	12	36.2	2
28.1	10.60	21	89.7	16	13.41	11	38.2	7	11.45	18	80.7	13	37.12	12	35.7	5
Sept. 7.1	10.41	19	87.7	20	13.31	10	37.5	7	11.29	16	79.1	16	37.01	11	34.9	8
17.1	10.26	15	85.3	24	13.24	7	36.8	7	11.16	13	77.4	17	36.93	8	33.8	11
27.1	10.14	12	82.6	27	13.20	4	36.2	6	11.08	8	75.5	19	36.87	6	32.5	13
Oct. 7.0	10.08	6	79.6	30	13.19	1	35.7	5	11.06	2	73.6	19	36.85	2	30.9	16
17.0	10.06	2	76.3	33	13.23	4	35.5	2	11.09	3	71.7	19	36.87	2	29.0	19
27.0	10.11	5	72.8	35	13.32	9	35.4	1	11.19	10	70.0	17	36.93	6	26.9	21
Nov. 6.0	10.22	11	69.2	36	13.46	14	35.6	2	11.36	17	68.5	15	37.04	11	24.5	24
15.9	10.40	18	65.6	36	13.64	18	36.1	5	11.60	24	67.3	12	37.20	16	22.0	25
25.9	10.65	25	62.1	35	13.88	24	36.9	8	11.90	30	66.5	8	37.41	21	19.4	26
Dec. 5.9	10.95	30	58.7	34	14.15	27	38.0	11	12.25	35	66.1	4	37.66	25	16.7	27
15.8	11.30	35	55.6	31	14.46	31	39.4	14	12.65	40	66.2	1	37.95	29	14.0	27
25.8	11.69	39	52.8	28	14.80	34	41.0	16	13.09	44	66.6	4	38.27	32	11.4	26
35.8	12.12	43	50.4	24	15.15	35	42.7	17	13.54	45	67.6	10	38.60	33	9.1	23
Sec δ, Tan δ	1.547		+1.181		1.050		−0.319		1.463		−1.067		1.056		+0.341	
Mean Place	9ˢ.237		91″.66		11ˢ.724		22″.09		10ˢ.046		55″.89		35ˢ.398		42″.32	
D′ψ α, Dω α	−0.01		+0.07		0.00		−0.02		+0.01		−0.06		0.00		+0.02	
Dψ δ, Dω δ	−0.4		−0.4		−0.4		−0.4		−0.4		−0.5		−0.4		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Apodis.** Var. 5.5–6.6				**τ Virginis.** Mag. 4.3				**11 Boötis.** Mag. 6.1				**β Centauri.** Mag. 0.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 13 56		° ′ −76 22		h m 13 57		° ′ + 1 57		h m 13 57		° ′ +27 47		h m 13 57		° ′ −59 57	
	s		″		s		″		s		″		s		″	
Jan. 0.8	50.94		43.4		15.90		29.5		16.51		49.7		43.17		20.6	
10.8	52.07	113	43.7	3	16.24	34	27.4	21	16.86	35	47.4	23	43.75	58	21.4	8
20.7	53.21	114	44.6	9	16.58	34	25.4	20	17.22	36	45.5	19	44.34	59	22.7	13
30.7	54.32	111	46.1	15	16.91	33	23.6	18	17.57	35	44.1	14	44.92	58	24.4	17
Feb. 9.7	55.37	105	48.0	19	17.22	31	22.0	16	17.91	34	43.1	10	45.47	55	26.5	21
19.7	56.36	99	50.4	24	17.50	28	20.6	14	18.22	31	42.6	5	45.97	50	28.9	24
Mar. 1.6	57.26	90	53.2	28	17.76	26	19.6	10	18.50	28	42.6	0	46.43	46	31.6	27
11.6	58.04	78	56.3	31	17.99	23	19.0	6	18.74	24	43.1	5	46.84	41	34.4	28
21.6	58.71	67	59.6	33	18.19	20	18.6	4	18.95	21	44.0	9	47.19	35	37.4	30
31.6	59.25	54	63.0	34	18.35	16	18.5	1	19.11	16	45.3	13	47.48	29	40.5	31
Apr. 10.5	59.67	42	66.5	35	18.48	13	18.6	1	19.24	13	46.9	16	47.71	23	43.6	31
20.5	59.95	28	70.1	36	18.58	10	19.0	4	19.33	9	48.6	17	47.88	17	46.6	30
30.5	60.09	14	73.5	34	18.65	7	19.5	5	19.38	5	50.5	19	47.98	10	49.5	29
May 10.4	60.10	1	76.8	33	18.69	4	20.2	7	19.40	2	52.5	20	48.03	5	52.2	27
20.4	59.98	12	80.0	32	18.70	1	20.9	7	19.39	1	54.4	19	48.02	1	54.7	25
30.4	59.74	24	82.8	28	18.70	0	21.7	8	19.35	4	56.2	18	47.96	6	57.0	23
June 9.4	59.37	37	85.3	25	18.66	4	22.5	8	19.28	7	57.8	16	47.84	12	58.9	19
19.3	58.89	48	87.5	22	18.61	5	23.3	8	19.20	8	59.2	14	47.67	17	60.5	16
29.3	58.32	57	89.2	17	18.54	7	24.0	7	19.09	11	60.4	12	47.46	21	61.6	11
July 9.3	57.67	65	90.4	12	18.46	8	24.7	7	18.96	13	61.3	9	47.22	24	62.4	8
19.3	56.97	70	91.0	6	18.36	10	25.3	6	18.83	13	61.9	6	46.94	28	62.8	4
29.2	56.23	74	91.2	2	18.25	11	25.8	5	18.68	15	62.2	3	46.64	30	62.6	2
Aug. 8.2	55.48	75	90.8	4	18.13	12	26.2	4	18.53	15	62.1	1	46.34	30	62.0	6
18.2	54.75	73	89.9	9	18.02	11	26.4	2	18.39	14	61.7	4	46.04	30	61.0	10
28.1	54.07	68	88.5	14	17.91	11	26.5	1	18.25	14	61.0	7	45.76	28	59.6	14
Sept. 7.1	53.46	61	86.6	19	17.81	10	26.5	0	18.12	13	59.9	11	45.51	25	57.9	17
17.1	52.96	50	84.3	23	17.73	8	26.2	3	18.02	10	58.5	14	45.31	20	55.9	20
27.1	52.59	37	81.8	25	17.68	5	25.8	4	17.94	8	56.7	18	45.17	14	53.6	23
Oct. 7.0	52.38	21	79.0	28	17.66	2	25.1	7	17.90	4	54.7	20	45.10	7	51.2	24
17.0	52.34	4	76.1	29	17.68	2	24.2	9	17.91	1	52.4	23	45.11	1	48.8	24
27.0	52.49	15	73.2	29	17.75	7	23.1	11	17.96	5	49.8	26	45.21	10	46.5	23
Nov. 6.0	52.82	33	70.5	27	17.86	11	21.7	14	18.06	10	47.0	28	45.41	20	44.4	21
15.9	53.34	52	68.0	25	18.02	16	20.1	16	18.21	15	44.1	29	45.69	28	42.5	19
25.9	54.02	68	65.8	22	18.22	20	18.3	18	18.41	20	41.2	29	46.06	37	41.0	15
Dec. 5.9	54.85	83	64.2	16	18.47	25	16.3	20	18.66	25	38.2	30	46.50	44	39.9	11
15.8	55.81	96	63.0	12	18.76	29	14.2	21	18.95	29	35.3	29	47.01	51	39.3	6
25.8	56.86	105	62.3	7	19.07	31	12.0	22	19.27	32	32.5	28	47.56	55	39.2	1
35.8	57.97	111	62.3	0	19.40	33	9.9	21	19.62	35	30.1	24	48.14	58	39.7	5
Sec δ, Tan δ	4.248		−4.129		1.001		+0.034		1.130		+0.527		1.998		−1.720	
Mean Place	$54^{\mathrm{s}}.475$		$56''.27$		$16^{\mathrm{s}}.114$		$37''.07$		$16^{\mathrm{s}}.564$		$65''.44$		$44^{\mathrm{s}}.614$		$31''.06$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.05		−0.24		0.00		0.00		−0.01		+0.03		+0.02		−0.10	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Hydræ. Mag. 3.5				θ Centauri. Mag. 2.3				α Draconis. Mag. 3.6				d Boötis. Mag. 4.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 14 1 s		° ′ −26 16 ″		h m 14 1 s		° ′ −35 56 ″		h m 14 2 s		° ′ +64 46 ″		h m 14 6 s		° ′ +25 29 ″	
Jan. 0.8	27.70		5.3		36.28		46.0		3.69		48.3		28.52		39.6	
10.8	28.07	37	6.9	16	36.69	41	47.4	14	4.27	58	46.3	20	28.87	35	37.2	24
20.8	28.44	37	8.7	18	37.09	40	49.0	16	4.87	60	44.9	14	29.22	35	35.3	19
30.7	28.80	36	10.6	19	37.48	39	50.9	19	5.48	61	44.1	8	29.57	35	33.7	16
Feb. 9.7	29.14	34	12.6	20	37.85	37	53.0	21	6.07	59	44.0	1	29.90	33	32.6	11
19.7	29.46	32	14.6	20	38.19	34	55.2	22	6.62	55	44.6	6	30.21	31	32.0	6
Mar. 1.6	29.75	29	16.6	20	38.50	31	57.4	22	7.11	49	45.8	12	30.49	28	31.9	1
11.6	30.01	26	18.5	19	38.78	28	59.6	22	7.54	43	47.6	18	30.74	25	32.2	3
21.6	30.23	22	20.2	17	39.02	24	61.8	22	7.88	34	49.8	22	30.96	22	33.0	8
31.6	30.42	19	21.9	17	39.22	20	63.9	21	8.15	27	52.4	26	31.13	17	34.2	12
Apr. 10.5	30.57	15	23.4	15	39.39	17	65.9	20	8.32	17	55.2	28	31.26	13	35.6	14
20.5	30.69	12	24.7	13	39.52	13	67.8	19	8.40	8	58.2	30	31.36	10	37.2	16
30.5	30.78	9	25.8	11	39.61	9	69.5	17	8.40	0	61.2	30	31.43	7	39.0	18
May 10.5	30.84	6	26.8	10	39.67	6	71.1	16	8.32	8	64.2	30	31.46	3	40.9	19
20.4	30.86	2	27.6	8	39.69	2	72.4	13	8.16	16	66.9	27	31.46	0	42.8	19
30.4	30.86	0	28.3	7	39.68	1	73.6	12	7.94	22	69.4	25	31.43	3	44.6	18
June 9.4	30.84	2	28.7	4	39.65	3	74.5	9	7.66	28	71.5	21	31.38	5	46.2	16
19.3	30.78	6	29.0	3	39.58	7	75.2	7	7.32	34	73.2	17	31.30	8	47.6	14
29.3	30.71	7	29.1	1	39.49	9	75.6	4	6.95	37	74.4	12	31.20	10	48.8	12
July 9.3	30.61	10	29.0	1	39.37	12	75.7	1	6.55	40	75.2	8	31.08	12	49.8	10
19.3	30.50	11	28.7	3	39.23	14	75.6	1	6.13	42	75.4	2	30.95	13	50.5	7
29.2	30.37	13	28.2	5	39.08	15	75.2	4	5.70	43	75.1	3	30.81	14	50.9	4
Aug. 8.2	30.24	13	27.6	6	38.93	15	74.6	6	5.27	43	74.3	8	30.66	15	50.9	0
18.2	30.10	14	26.8	8	38.77	16	73.7	9	4.85	42	73.0	13	30.52	14	50.6	3
28.2	29.97	13	25.9	9	38.62	15	72.7	10	4.46	39	71.2	18	30.38	14	50.0	6
Sept. 7.1	29.86	11	24.9	10	38.48	14	71.4	13	4.11	35	68.9	23	30.25	13	49.1	9
17.1	29.77	9	23.9	10	38.38	10	70.1	13	3.80	31	66.2	27	30.14	11	47.8	13
27.1	29.71	6	23.0	9	38.30	8	68.7	14	3.54	26	63.2	30	30.06	8	46.2	16
Oct. 7.0	29.69	2	22.1	9	38.27	3	67.3	14	3.36	18	59.9	33	30.02	4	44.3	19
17.0	29.71	2	21.3	8	38.29	2	66.0	13	3.25	11	56.3	36	30.01	1	42.1	22
27.0	29.78	7	20.7	6	38.37	8	64.9	11	3.23	2	52.5	38	30.05	4	39.7	24
Nov. 6.0	29.91	13	20.4	3	38.51	14	64.0	9	3.30	7	48.6	39	30.14	9	37.0	27
15.9	30.09	18	20.3	1	38.71	20	63.3	7	3.47	17	44.8	38	30.29	15	34.2	28
25.9	30.33	24	20.5	2	38.96	25	63.0	3	3.73	26	41.0	38	30.48	19	31.3	29
Dec. 5.9	30.60	27	21.1	6	39.26	30	63.1	1	4.08	35	37.5	35	30.72	24	28.4	29
15.9	30.92	32	22.0	9	39.60	34	63.6	5	4.51	43	34.2	33	31.00	28	25.5	29
25.8	31.27	35	23.1	11	39.98	38	64.4	8	5.01	50	31.4	28	31.31	31	22.8	27
35.8	31.63	36	24.6	15	40.37	39	65.5	11	5.56	55	29.0	24	31.65	34	20.3	25
Sec δ, Tan δ	1.115		−0.494		1.235		−0.725		2.347		+2.123		1.108		+0.477	
Mean Place	28s.215		6″.86		36s.959		50″.41		3s.680		71″.78		28s.652		54″.73	
D′ψ α, Dω α	+0.01		−0.03		+0.01		−0.04		−0.03		+0.12		−0.01		+0.03	
Dψ δ, Dω δ	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	κ Virginis. Mag. 4.3				4 Ursæ Minoris. Mag. 5.0				ι Virginis. Mag. 4.2				α Boötis. Mag. 0.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 8		− 9 52		14 9		+77 56		14 11		− 5 35		14 11		+19 37	
	s		″		s		″		s		″		s		″	
Jan. 0.8	18.00		30.0		9.56		41.1		29.82		31.5		44.10		33.3	
10.8	18.34	34	31.9	19	10.60	104	39.3	18	30.15	33	33.5	20	44.44	34	30.9	24
20.8	18.68	34	33.8	19	11.71	111	38.0	13	30.49	34	35.5	20	44.78	34	28.9	20
30.7	19.02	34	35.7	19	12.83	112	37.5	5	30.83	34	37.4	19	45.12	34	27.2	17
Feb. 9.7	19.34	32	37.5	18	13.93	110	37.6	1	31.14	31	39.1	17	45.44	32	25.9	13
19.7	19.64	30	39.1	16	14.97	104	38.4	8	31.44	30	40.6	15	45.74	30	25.0	9
Mar. 1.6	19.91	27	40.5	14	15.92	95	39.8	14	31.71	27	41.8	12	46.02	28	24.6	4
11.6	20.15	24	41.7	12	16.73	81	41.7	19	31.95	24	42.8	10	46.26	24	24.6	0
21.6	20.36	21	42.6	9	17.39	66	44.1	24	32.16	21	43.6	8	46.47	21	25.1	5
31.6	20.54	18	43.4	8	17.88	49	46.8	27	32.34	18	44.1	5	46.64	17	25.8	7
Apr. 10.5	20.68	14	43.9	5	18.19	31	49.8	30	32.49	15	44.4	3	46.78	14	26.9	11
20.5	20.80	12	44.2	3	18.30	11	53.0	32	32.60	11	44.5	1	46.89	11	28.2	13
30.5	20.89	9	44.4	2	18.23	7	56.1	31	32.69	9	44.4	1	46.96	7	29.7	15
May 10.5	20.95	6	44.4	0	17.98	25	59.0	29	32.75	6	44.1	3	47.00	4	31.3	16
20.4	20.98	3	44.2	2	17.57	41	61.8	28	32.78	3	43.8	3	47.01	1	32.9	16
30.4	20.98	0	44.0	2	17.01	56	64.3	25	32.79	1	43.3	5	46.99	2	34.4	15
June 9.4	20.96	2	43.7	3	16.32	69	66.4	21	32.77	2	42.8	5	46.95	4	35.8	14
19.3	20.92	4	43.3	4	15.53	79	68.0	16	32.73	4	42.3	5	46.88	7	37.1	13
29.3	20.86	6	42.9	4	14.65	88	69.2	12	32.67	6	41.8	5	46.80	8	38.2	11
July 9.3	20.78	8	42.4	5	13.70	95	69.8	6	32.59	8	41.2	6	46.69	11	39.1	9
19.3	20.68	10	41.9	5	12.72	98	69.9	1	32.49	10	40.7	5	46.57	12	39.8	7
29.2	20.57	11	41.4	5	11.73	99	69.4	5	32.38	11	40.2	5	46.44	13	40.2	4
Aug. 8.2	20.45	12	40.8	6	10.74	99	68.4	10	32.26	12	39.7	5	46.30	14	40.3	1
18.2	20.33	12	40.3	5	9.78	96	66.9	15	32.14	12	39.3	4	46.16	14	40.2	1
28.2	20.21	12	39.9	4	8.87	91	65.0	19	32.03	11	39.0	3	46.03	13	39.7	5
Sept. 7.1	20.11	10	39.5	4	8.03	84	62.5	25	31.92	11	38.7	3	45.90	13	39.0	7
17.1	20.02	9	39.2	3	7.29	74	59.7	28	31.84	8	38.6	1	45.80	10	37.9	11
27.1	19.96	6	39.0	2	6.67	62	56.5	32	31.77	7	38.7	1	45.72	8	36.5	14
Oct. 7.0	19.94	2	39.0	0	6.18	49	53.0	35	31.74	3	38.9	2	45.67	5	34.9	16
17.0	19.95	1	39.2	2	5.84	34	49.3	37	31.75	1	39.3	4	45.66	1	33.0	19
27.0	20.01	6	39.6	4	5.67	17	45.4	39	31.81	6	40.0	7	45.70	4	30.8	22
Nov. 6.0	20.12	11	40.2	6	5.68	1	41.5	39	31.91	10	40.9	9	45.79	9	28.4	24
15.9	20.28	16	41.1	9	5.87	19	37.6	39	32.06	15	42.1	12	45.92	13	25.8	26
25.9	20.48	20	42.2	11	6.24	37	33.9	37	32.26	20	43.4	13	46.11	19	23.1	27
Dec. 5.9	20.73	25	43.6	14	6.79	55	30.4	35	32.50	24	45.0	16	46.34	23	20.4	27
15.9	21.02	29	45.2	16	7.50	71	27.2	32	32.78	28	46.8	18	46.61	27	17.6	28
25.8	21.34	32	46.9	17	8.37	87	24.5	27	33.09	31	48.7	19	46.91	30	14.9	27
35.8	21.67	33	48.8	19	9.34	97	22.2	23	33.42	33	50.7	20	47.24	33	12.4	25
Sec δ, Tan δ	1.015		−0.174		4.789		+4.683		1.005		−0.098		1.062		+0.356	
Mean Place	18ˢ.365		26″.03		9ˢ.894		65″.64		30ˢ.164		26″.04		44ˢ.294		46″.86	
D′ψ α, Dω α	0.00		−0.01		−0.07		+0.26		0.00		−0.01		−0.01		+0.02	
Dψ δ, Dω δ	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**λ Boötis.** Mag. 4.3				**λ Virginis.** Mag. 4.6				**2 Libræ.** Mag. 6.3				**θ Boötis.** Mag. 4.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 13		+46 28		14 14		−12 58		14 18		−11 19		14 22		+52 14	
	s		″		s		″		s		″		s		″	
Jan. 0.8	6.83		37.6		26.76		35.9		47.37		22.1		15.97		30.8	
10.8	7.23	40	35.3	23	27.10	34	37.7	18	47.71	34	24.0	19	16.40	43	28.4	24
20.8	7.65	42	33.5	18	27.45	35	39.6	19	48.06	35	25.9	19	16.85	45	26.5	19
30.7	8.07	42	32.2	13	27.79	34	41.4	18	48.40	34	27.7	18	17.30	45	25.3	12
Feb. 9.7	8.47	40	31.6	6	28.12	33	43.2	18	48.72	32	29.4	17	17.74	44	24.6	7
19.7	8.85	38	31.6	0	28.42	30	44.9	17	49.02	30	31.0	16	18.16	42	24.7	1
Mar. 1.7	9.20	35	32.1	5	28.70	28	46.4	15	49.30	28	32.4	14	18.55	39	25.3	6
11.6	9.50	30	33.2	11	28.95	25	47.7	13	49.55	25	33.7	13	18.89	34	26.5	12
21.6	9.76	26	34.9	17	29.16	21	48.8	11	49.77	22	34.7	10	19.18	29	28.3	18
31.6	9.96	20	36.9	20	29.35	19	49.6	8	49.96	19	35.5	8	19.41	23	30.4	21
Apr. 10.5	10.12	16	39.2	23	29.50	15	50.3	7	50.12	16	36.1	6	19.59	18	32.9	25
20.5	10.22	10	41.7	25	29.63	13	50.8	5	50.25	13	36.5	4	19.70	11	35.6	27
30.5	10.27	5	44.4	27	29.72	9	51.1	3	50.34	9	36.7	2	19.76	6	38.4	28
May 10.5	10.28	1	47.0	26	29.79	7	51.3	2	50.41	7	36.7	0	19.77	1	41.2	28
20.4	10.24	4	49.6	26	29.83	4	51.4	1	50.45	4	36.7	0	19.72	5	43.9	27
30.4	10.16	8	52.0	24	29.84	1	51.3	1	50.47	2	36.5	2	19.62	10	46.4	25
June 9.4	10.04	12	54.1	21	29.82	2	51.1	2	50.46	1	36.3	2	19.48	14	48.7	23
19.4	9.90	14	55.9	18	29.78	4	50.9	2	50.42	4	36.0	3	19.31	17	50.6	19
29.3	9.73	17	57.4	15	29.73	5	50.5	4	50.37	5	35.6	4	19.10	21	52.2	16
July 9.3	9.53	20	58.4	10	29.65	8	50.1	4	50.29	8	35.1	5	18.87	23	53.3	11
19.3	9.31	22	59.0	6	29.55	10	49.7	4	50.19	10	34.7	4	18.61	26	53.9	6
29.2	9.09	22	59.2	2	29.43	12	49.2	5	50.08	11	34.2	5	18.34	27	54.1	2
Aug. 8.2	8.86	23	58.9	3	29.31	12	48.6	6	49.96	12	33.7	5	18.06	28	53.8	3
18.2	8.63	23	58.2	7	29.19	12	48.1	5	49.84	12	33.2	5	17.78	28	53.0	8
28.2	8.41	22	57.0	12	29.07	12	47.6	5	49.72	12	32.7	5	17.52	26	51.7	13
Sept. 7.1	8.21	20	55.4	16	28.96	11	47.1	5	49.60	12	32.3	4	17.27	25	50.0	17
17.1	8.03	18	53.3	21	28.87	9	46.7	4	49.51	9	31.9	4	17.05	22	47.9	21
27.1	7.89	14	50.9	24	28.81	6	46.3	4	49.44	7	31.7	2	16.87	18	45.3	26
Oct. 7.1	7.79	10	48.1	28	28.78	3	46.2	1	49.41	3	31.6	1	16.73	14	42.4	29
17.0	7.74	5	45.1	30	28.78	0	46.2	0	49.41	0	31.7	1	16.65	8	39.2	32
27.0	7.75	1	41.8	33	28.84	6	46.3	1	49.46	5	32.0	3	16.62	3	35.8	34
Nov. 6.0	7.81	6	38.3	35	28.94	10	46.8	5	49.56	10	32.5	5	16.67	5	32.2	36
15.9	7.94	13	34.8	35	29.10	16	47.5	7	49.71	15	33.3	8	16.78	11	28.5	37
25.9	8.14	20	31.2	36	29.30	20	48.4	9	49.91	20	34.3	10	16.97	19	24.8	37
Dec. 5.9	8.40	26	27.8	34	29.55	25	49.6	12	50.15	24	35.5	12	17.22	25	21.2	36
15.9	8.70	30	24.5	33	29.83	28	51.0	14	50.43	28	37.0	15	17.54	32	17.8	34
25.8	9.05	35	21.5	30	30.15	32	52.6	16	50.74	31	38.7	17	17.90	36	14.7	31
35.8	9.44	39	18.9	26	30.48	33	54.4	18	51.07	33	40.5	18	18.31	41	12.0	27
Sec δ, Tan δ	1.452		+1.053		1.026		−0.231		1.020		−0.200		1.633		+1.291	
Mean Place	6ˢ.956		58″.08		27ˢ.189		32″.70		47ˢ.807		18″.27		16ˢ.199		52″.32	
$D'_\psi a$, $D_\omega a$	−0.02		+0.06		0.00		−0.01		0.00		−0.01		−0.02		+0.07	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.5		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**f Boötis.** Mag. 5.4				**φ Virginis.** Mag. 5.0				**δ Ursæ Minoris.** Mag. 4.4				**ρ Boötis.** Mag. 3.8		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declin tion N
	h m		° ′		h m		° ′		h m		° ′		h m		°
	14 22		+19 36		14 23		− 1 50		14 27		+76 4		14 28		+30
	s		″		s		″		s		″		s		″
Jan. 0.8	27.08		33.3		45.81		41.5		40.65		17.9		7.19		37.6
10.8	27.41	33	30.9	24	46.14	33	43.6	21	41.54	89	15.8	21	7.53	34	35.1
20.8	27.75	34	28.9	20	46.48	34	45.5	19	42.48	94	14.3	15	7.89	36	33.1
30.7	28.09	34	27.2	17	46.81	33	47.3	18	43.46	98	13.4	9	8.24	35	31.4
Feb. 9.7	28.42	33	25.9	13	47.13	32	48.9	16	44.44	98	13.3	1	8.59	35	30.3
19.7	28.73	31	25.0	9	47.43	30	50.3	14	45.37	93	13.8	5	8.92	33	29.8
Mar. 1.7	29.01	28	24.6	4	47.70	27	51.4	11	46.23	86	14.9	11	9.22	30	29.7
11.6	29.26	25	24.7	1	47.95	25	52.3	9	46.99	76	16.6	17	9.50	28	30.2
21.6	29.48	22	25.2	5	48.17	22	52.8	5	47.63	64	18.8	22	9.73	23	31.1
31.6	29.67	19	26.0	8	48.36	19	53.1	3	48.13	50	21.5	27	9.93	20	32.5
Apr. 10.6	29.82	15	27.1	11	48.51	15	53.1	0	48.47	34	24.4	29	10.09	16	34.1
20.5	29.93	11	28.5	14	48.64	13	52.9	2	48.65	18	27.5	31	10.21	12	36.1
30.5	30.02	9	30.1	16	48.73	9	52.6	3	48.67	2	30.6	31	10.30	9	38.2
May 10.5	30.07	5	31.7	16	48.80	7	52.1	5	48.53	14	33.7	31	10.34	4	40.3
20.4	30.09	2	33.4	17	48.84	4	51.5	6	48.25	28	36.6	29	10.35	1	42.5
30.4	30.08	1	35.0	16	48.86	2	50.8	7	47.83	42	39.3	27	10.33	2	44.6
June 9.4	30.05	3	36.6	16	48.85	1	50.1	7	47.29	54	41.5	22	10.28	5	46.5
19.4	29.99	6	38.0	14	48.81	4	49.4	7	46.65	64	43.4	19	10.21	7	48.2
29.3	29.92	7	39.2	12	48.76	5	48.7	7	45.93	72	44.8	14	10.10	11	49.6
July 9.3	29.82	10	40.2	10	48.68	8	48.1	6	45.14	79	45.8	10	9.98	12	50.8
19.3	29.70	12	41.0	8	48.59	9	47.5	6	44.30	84	46.2	4	9.84	14	51.6
29.2	29.57	13	41.5	5	48.48	11	47.0	5	43.44	86	46.0	2	9.68	16	52.1
Aug. 8.2	29.43	14	41.7	2	48.36	12	46.5	5	42.57	87	45.3	7	9.52	16	52.2
18.2	29.29	14	41.7	0	48.23	13	46.1	4	41.72	85	44.1	12	9.35	17	52.0
28.2	29.15	14	41.3	4	48.11	12	45.9	2	40.90	82	42.4	17	9.18	17	51.4
Sept. 7.1	29.02	13	40.7	6	48.00	11	45.8	1	40.13	77	40.2	22	9.02	16	50.4
17.1	28.91	11	39.7	10	47.90	10	45.8	0	39.43	70	37.6	26	8.89	13	49.0
27.1	28.82	9	38.5	12	47.83	7	46.1	3	38.83	60	34.6	30	8.78	11	47.3
Oct. 7.1	28.76	6	37.0	15	47.78	5	46.5	4	38.34	49	31.3	33	8.70	8	45.3
17.0	28.74	2	35.1	19	47.78	0	47.1	6	37.97	37	27.8	35	8.66	4	42.9
27.0	28.77	3	33.0	21	47.82	4	48.0	9	37.75	22	24.0	38	8.67	1	40.3
Nov. 6.0	28.85	8	30.7	23	47.91	9	49.1	11	37.68	7	20.1	39	8.73	6	37.5
15.9	28.98	13	28.2	25	48.05	14	50.4	13	37.78	10	16.2	39	8.85	12	34.5
25.9	29.15	17	25.6	26	48.23	18	51.9	15	38.04	26	12.4	38	9.02	17	31.4
Dec. 5.9	29.38	23	22.9	27	48.46	23	53.7	18	38.46	42	8.8	36	9.24	22	28.3
15.9	29.64	26	20.1	28	48.73	27	55.6	19	39.03	57	5.4	34	9.50	26	25.2
25.8	29.94	30	17.5	26	49.03	30	57.6	20	39.74	71	2.5	29	9.81	31	22.3
35.8	30.26	32	15.0	25	49.35	32	59.6	20	40.56	82	0.0	25	10.14	33	19.7
Sec δ, Tan δ	1.062		+0.356		1.001		−0.032		4.155		+4.033		1.163		+0.595
Mean Place	27ˢ.332		46″.95		46ˢ.191		34″.46		41ˢ.465		42″.15		7ˢ.449		54″.38
D′ψ a, Dω a	−0.01		+0.02		0.00		0.00		−0.06		+0.22		−0.01		+0.03
Dψ δ, Dω δ	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Boötis. Mag. 3.0				η Centauri. Mag. 2.6				σ Boötis. Mag. 4.5				α² Centauri. Mag. 0.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 14 28		° ′ +38 40		h m 14 30		° ′ −41 46		h m 14 30		° ′ +30 6		h m 14 33		° ′ −60 28	
	s		″		s		″		s		″		s		″	
Jan. 0.8	36.69	36	43.6	25	1.47	42	45.6	9	55.91	34	49.1	24	43.89	58	36.5	4
10.8	37.05	38	41.1	20	1.89	43	46.5	12	56.25	36	46.7	21	44.47	59	36.9	8
20.8	37.43	38	39.1	15	2.32	43	47.7	15	56.61	36	44.6	17	45.06	59	37.7	13
30.7	37.81	37	37.6	9	2.75	41	49.2	18	56.97	34	42.9	11	45.65	56	39.0	17
Feb. 9.7	38.18	35	36.7	4	3.16	39	51.0	20	57.31	33	41.8	6	46.21	54	40.7	20
19.7	38.53	33	36.3	2	3.55	36	53.0	21	57.64	31	41.2	1	46.75	50	42.7	23
Mar. 1.7	38.86	29	36.5	7	3.91	33	55.1	21	57.95	27	41.1	4	47.25	45	45.0	25
11.6	39.15	25	37.2	13	4.24	29	57.2	22	58.22	24	41.5	9	47.70	39	47.5	27
21.6	39.40	21	38.5	17	4.53	25	59.4	22	58.46	20	42.4	13	48.09	34	50.2	28
31.6	39.61	16	40.2	20	4.78	22	61.6	22	58.66	16	43.7	17	48.43	28	53.0	29
Apr. 10.6	39.77	12	42.2	22	5.00	17	63.8	20	58.82	12	45.4	19	48.71	22	55.9	28
20.5	39.89	8	44.4	24	5.17	14	65.8	20	58.94	9	47.3	21	48.93	16	58.7	29
30.5	39.97	4	46.8	25	5.31	10	67.8	18	59.03	5	49.4	21	49.09	9	61.6	27
May 10.5	40.01	0	49.3	24	5.41	6	69.6	17	59.08	2	51.5	21	49.18	3	64.3	25
20.4	40.01	4	51.7	23	5.47	2	71.3	14	59.10	2	53.6	21	49.21	2	66.8	23
30.4	39.97	7	54.0	22	5.49	1	72.7	13	59.08	4	55.7	19	49.19	9	69.1	20
June 9.4	39.90	10	56.2	18	5.48	5	74.0	10	59.04	7	57.6	18	49.10	14	71.1	18
19.4	39.80	13	58.0	16	5.43	9	75.0	8	58.97	10	59.4	14	48.96	20	72.9	14
29.3	39.67	15	59.6	12	5.34	11	75.8	5	58.87	12	60.8	12	48.76	23	74.3	10
July 9.3	39.52	17	60.8	8	5.23	15	76.3	2	58.75	14	62.0	9	48.53	28	75.3	6
19.3	39.35	19	61.6	4	5.08	16	76.5	1	58.61	16	62.9	5	48.25	31	75.9	2
29.3	39.16	19	62.0	0	4.92	18	76.4	4	58.45	16	63.4	1	47.94	32	76.1	3
Aug. 8.2	38.97	20	62.0	4	4.74	18	76.0	7	58.29	17	63.5	2	47.62	33	75.8	7
18.2	38.77	19	61.6	8	4.56	18	75.3	10	58.12	16	63.3	5	47.29	32	75.1	11
28.2	38.58	18	60.8	12	4.38	17	74.3	11	57.96	16	62.8	10	46.97	30	74.0	15
Sept. 7.1	38.40	16	59.6	17	4.21	15	73.2	14	57.80	14	61.8	13	46.67	25	72.5	18
17.1	38.24	14	57.9	20	4.06	11	71.8	15	57.66	11	60.5	17	46.42	20	70.7	21
27.1	38.10	10	55.9	23	3.95	7	70.3	16	57.55	8	58.8	20	46.22	13	68.6	23
Oct. 7.1	38.00	5	53.6	27	3.88	1	68.7	16	57.47	4	56.8	23	46.09	5	66.3	24
17.0	37.95	0	50.9	30	3.87	5	67.1	15	57.43	1	54.5	25	46.04	4	63.9	23
27.0	37.95	5	47.9	31	3.92	11	65.6	13	57.44	6	52.0	28	46.08	13	61.6	23
Nov. 6.0	38.00	11	44.8	33	4.03	17	64.3	11	57.50	11	49.2	30	46.21	23	59.3	20
16.0	38.11	17	41.5	34	4.20	24	63.2	8	57.61	17	46.2	31	46.44	32	57.3	18
25.9	38.28	23	38.1	33	4.44	30	62.4	5	57.78	22	43.1	31	46.76	40	55.5	13
Dec. 5.9	38.51	27	34.8	33	4.74	34	61.9	1	58.00	26	40.0	30	47.16	47	54.2	10
15.9	38.78	32	31.5	30	5.08	38	61.8	3	58.26	30	37.0	29	47.63	53	53.2	4
25.8	39.10	35	28.5	27	5.46	42	62.1	7	58.56	33	34.1	27	48.16	56	52.8	0
35.8	39.45		25.8		5.88		62.8		58.89		31.4		48.72		52.8	
Sec δ, Tan δ	1.281		+0.801		1.341		−0.894		1.156		+0.580		2.030		−1.766	
Mean Place	$36^{s}.949$		$62''.39$		$2^{s}.433$		$50''.13$		$56^{s}.196$		$65''.78$		$44^{s}.887$		$51''.79$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		+0.04		+0.01		−0.05		−0.01		+0.03		+0.03		−0.09	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Boötis. Mag. 5.4				α Apodis. Mag. 3.8				μ Virginis. Mag. 4.0				ε Boötis. Mag. 2.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 14 35 s		° ′ +44 45 ″		h m 14 37 s		° ′ −78 40 ″		h m 14 38 s		° ′ − 5 17 ″		h m 14 41 s		° ′ +27 25 ″	
Jan. 0.8	37.93		70.4		2.03		40.3		31.09		11.9		13.52		54.4	
10.8	38.31	38	67.9	25	3.34	131	40.0	3	31.42	33	13.8	19	13.85	33	51.9	25
20.8	38.71	40	65.8	21	4.69	135	40.2	2	31.75	33	15.7	19	14.20	35	49.8	21
30.7	39.12	41	64.3	15	6.05	136	41.0	8	32.09	34	17.5	18	14.55	35	48.0	18
Feb. 9.7	39.52	40	63.4	9	7.39	134	42.3	13	32.41	32	19.1	16	14.89	34	46.8	12
19.7	39.90	38	63.2	2	8.68	129	44.1	18	32.72	31	20.6	15	15.21	32	46.1	7
Mar. 1.7	40.25	35	63.5	3	9.88	120	46.3	22	33.01	29	21.8	12	15.52	31	45.8	3
11.6	40.56	31	64.4	9	10.98	110	48.9	26	33.27	26	22.7	9	15.79	27	46.1	3
21.6	40.84	28	65.8	14	11.96	98	51.8	29	33.50	23	23.4	7	16.03	24	46.9	8
31.6	41.07	23	67.6	18	12.80	84	55.0	32	33.70	20	23.8	4	16.24	21	48.0	11
Apr. 10.6	41.25	18	69.8	22	13.49	69	58.3	33	33.87	17	24.0	2	16.41	17	49.5	15
20.5	41.38	13	72.3	25	14.03	54	61.7	34	34.01	14	24.0	0	16.54	13	51.3	18
30.5	41.46	8	74.9	26	14.41	38	65.1	34	34.13	12	23.8	2	16.64	10	53.2	19
May 10.5	41.50	4	77.6	27	14.62	21	68.5	34	34.21	8	23.5	3	16.71	7	55.3	21
20.4	41.49	1	80.2	26	14.67	5	71.8	33	34.27	6	23.1	4	16.74	3	57.4	21
30.4	41.44	5	82.7	25	14.55	12	74.8	30	34.30	3	22.6	5	16.74	0	59.4	20
June 9.4	41.36	8	85.0	23	14.27	28	77.6	28	34.30	0	22.0	6	16.70	4	61.3	19
19.4	41.24	12	87.0	20	13.84	43	80.2	26	34.28	2	21.5	5	16.64	6	63.0	17
29.3	41.08	16	88.7	17	13.26	58	82.3	21	34.23	5	20.9	6	16.56	8	64.5	15
July 9.3	40.90	18	90.0	13	12.57	69	84.0	17	34.16	7	20.3	6	16.45	11	65.8	13
19.3	40.70	20	90.8	8	11.78	79	85.2	12	34.07	9	19.8	5	16.31	14	66.7	9
29.3	40.49	21	91.3	5	10.91	87	85.9	7	33.96	11	19.2	6	16.17	14	67.3	6
Aug. 8.2	40.26	23	91.2	1	9.99	92	86.0	1	33.84	12	18.8	4	16.01	16	67.6	3
18.2	40.03	23	90.8	4	9.07	92	85.6	4	33.72	12	18.4	4	15.85	16	67.5	1
28.2	39.80	23	89.9	9	8.17	90	84.7	9	33.59	13	18.1	3	15.68	17	67.1	4
Sept. 7.1	39.58	22	88.5	14	7.34	83	83.3	14	33.47	12	17.9	2	15.52	16	66.3	8
17.1	39.39	19	86.7	18	6.60	74	81.4	19	33.36	11	17.8	1	15.38	14	65.1	12
27.1	39.23	16	84.5	22	6.00	60	79.1	23	33.28	8	17.8	0	15.27	11	63.6	15
Oct. 7.1	39.11	12	82.0	25	5.56	44	76.5	26	33.23	5	18.0	2	15.18	9	61.8	18
17.0	39.03	8	79.1	29	5.32	24	73.6	29	33.21	2	18.5	5	15.13	5	59.6	22
27.0	39.00	3	75.9	32	5.30	2	70.7	29	33.24	3	19.1	6	15.13	0	57.2	24
Nov. 6.0	39.04	4	72.6	33	5.50	20	67.8	29	33.32	8	20.0	9	15.18	5	54.6	26
16.0	39.14	10	69.1	35	5.92	42	65.0	28	33.44	12	21.1	11	15.28	10	51.7	29
25.9	39.30	16	65.6	35	6.57	65	62.5	25	33.62	18	22.4	13	15.44	16	48.8	29
Dec. 5.9	39.52	22	62.1	35	7.41	84	60.3	22	33.84	22	23.9	15	15.64	20	45.8	30
15.9	39.80	28	58.7	34	8.42	101	58.5	18	34.10	26	25.6	17	15.89	25	42.8	30
25.8	40.12	32	55.6	31	9.58	116	57.3	12	34.39	29	27.4	18	16.18	29	39.9	29
35.8	40.48	36	52.8	28	10.85	127	56.6	7	34.71	32	29.3	19	16.50	32	37.2	27
Sec δ, Tan δ	1.409		+0.992		5.096		−4.997		1.004		−0.093		1.127		+0.519	
Mean Place	38ˢ.267		90″.45		7ˢ.077		50″.88		31ˢ.574		5″.53		13ˢ.874		70″.39	
D′ψ α, Dω α	−0.02		+0.05		+0.08		−0.26		0.00		0.00		−0.01		+0.03	
Dψ δ, Dω δ	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**109 Virginis.** Mag. 3.8				**8 Libræ.** Mag. 5.3				***α* Libræ.** Mag. 2.9				**Groombridge 2164.** Mag. 5.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 14 41		° ′ + 2 14		h m 14 45		° ′ −15 38		h m 14 46		° ′ −15 41		h m 14 49		° ′ +59 37	
	s		″		s		″		s		″		s		″	
Jan. 0.8	53.54		68.2		55.01		28.2		6.46		9.4		14.73		73.0	
10.8	53.87	33	66.2	20	55.35	34	29.8	16	6.79	33	11.0	16	15.19	46	70.4	26
20.8	54.20	33	64.2	20	55.70	35	31.5	17	7.14	35	12.7	17	15.69	50	68.4	20
30.8	54.53	33	62.4	18	56.04	34	33.2	17	7.48	34	14.4	17	16.21	52	66.9	15
Feb. 9.7	54.85	32	60.8	16	56.38	34	34.9	17	7.82	34	16.0	16	16.72	51	66.2	7
19.7	55.15	30	59.5	13	56.70	32	36.4	15	8.14	32	17.6	16	17.22	50	66.1	1
Mar. 1.7	55.44	29	58.6	9	57.00	30	37.8	14	8.44	30	19.0	14	17.69	47	66.7	6
11.6	55.70	26	57.9	7	57.27	27	39.1	13	8.72	28	20.3	13	18.12	43	67.8	11
21.6	55.93	23	57.6	3	57.52	25	40.2	11	8.96	24	21.4	11	18.49	37	69.6	18
31.6	56.13	20	57.5	1	57.73	21	41.2	10	9.18	22	22.3	9	18.79	30	71.8	22
Apr. 10.6	56.30	17	57.7	2	57.92	19	41.9	7	9.37	19	23.1	8	19.03	24	74.4	26
20.5	56.44	14	58.2	5	58.08	16	42.5	6	9.52	15	23.7	6	19.20	17	77.2	28
30.5	56.55	11	58.8	6	58.21	13	42.9	4	9.65	13	24.1	4	19.30	10	80.2	30
May 10.5	56.64	9	59.6	8	58.30	9	43.1	2	9.75	10	24.3	2	19.33	3	83.3	31
20.5	56.69	5	60.5	9	58.37	7	43.3	2	9.82	7	24.5	2	19.29	4	86.3	30
30.4	56.72	3	61.4	9	58.42	5	43.3	0	9.86	4	24.5	0	19.18	11	89.1	28
June 9.4	56.72	0	62.3	9	58.43	1	43.3	0	9.87	1	24.5	0	19.02	16	91.6	25
19.4	56.69	3	63.2	9	58.41	2	43.2	1	9.86	1	24.4	1	18.81	21	93.9	23
29.3	56.64	5	64.1	9	58.37	4	42.9	3	9.82	4	24.2	2	18.55	26	95.7	18
July 9.3	56.57	7	64.9	8	58.30	7	42.7	2	9.75	7	23.9	3	18.25	30	97.1	14
19.3	56.48	9	65.6	7	58.21	9	42.3	4	9.66	9	23.5	4	17.92	33	98.0	9
29.3	56.37	11	66.1	5	58.10	11	41.9	4	9.54	12	23.1	4	17.56	36	98.5	5
Aug. 8.2	56.25	12	66.6	5	57.98	12	41.4	5	9.42	12	22.7	4	17.19	37	98.4	1
18.2	56.12	13	66.9	3	57.84	14	41.0	4	9.29	13	22.2	5	16.82	37	97.8	6
28.2	55.99	13	67.0	1	57.71	13	40.5	5	9.16	13	21.7	5	16.45	37	96.7	11
Sept. 7.2	55.86	13	67.0	0	57.58	13	40.0	5	9.03	13	21.2	5	16.10	35	95.1	16
17.1	55.75	11	66.8	2	57.47	11	39.5	5	8.91	12	20.7	5	15.78	32	93.1	20
27.1	55.66	9	66.4	4	57.38	9	39.1	4	8.82	9	20.3	4	15.49	29	90.6	25
Oct. 7.1	55.60	6	65.8	6	57.32	6	38.8	3	8.76	6	20.0	3	15.26	23	87.7	29
17.0	55.58	2	65.0	8	57.29	3	38.6	2	8.74	2	19.8	2	15.08	18	84.6	31
27.0	55.60	2	64.0	10	57.32	3	38.6	0	8.76	2	19.8	0	14.98	10	81.1	35
Nov. 6.0	55.67	7	62.7	13	57.39	7	38.8	2	8.84	8	20.0	2	14.96	2	77.4	37
16.0	55.79	12	61.1	16	57.52	13	39.2	4	8.96	12	20.4	4	15.01	5	73.6	38
25.9	55.95	16	59.4	17	57.70	18	39.9	7	9.14	18	21.1	7	15.15	14	69.8	38
Dec. 5.9	56.16	21	57.5	19	57.92	22	40.8	9	9.36	22	22.0	9	15.38	23	66.1	37
15.9	56.41	25	55.5	20	58.19	27	41.9	11	9.63	27	23.1	11	15.68	30	62.5	36
25.9	56.70	29	53.4	21	58.49	30	43.3	14	9.93	30	24.5	14	16.06	38	59.3	32
35.8	57.01	31	51.3	21	58.81	32	44.8	15	10.26	33	26.0	15	16.49	43	56.4	29
Sec δ, Tan δ	1.001		+0.039		1.038		−0.280		1.039		−0.281		1.978		+1.707	
Mean Place	$53^{s}.993$		$77''.01$		$55^{s}.621$		$24''.78$		$7^{s}.066$		$5''.97$		$15^{s}.363$		$95''.32$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		0.00		0.00		−0.01		0.00		−0.01		−0.03		+0.08	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		−0.6		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ursæ Minoris. Mag. 2.2				ξ^2 Libræ. Mag. 5.6				Piazzi 221. Mag. 5.8				β Lupi. Mag. 2.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 50		+74 29		14 52		−11 3		14 52		+14 47		14 52		−42 47	
	s		″		s		″		s		″		s		″	
Jan. 0.8	55.35	76	61.3	24	5.33	33	52.6	17	9.15	32	23.2	24	52.33	42	14.5	6
10.8	56.11	83	58.9	18	5.66	34	54.3	17	9.47	33	20.8	21	52.75	43	15.1	10
20.8	56.94	87	57.1	12	6.00	34	56.0	17	9.80	33	18.7	18	53.18	44	16.1	12
30.8	57.81	89	55.9	5	6.34	33	57.7	16	10.13	33	16.9	15	53.62	42	17.3	15
Feb. 9.7	58.70	87	55.4	1	6.67	32	59.3	15	10.46	31	15.4	10	54.04	41	18.8	17
19.7	59.57	81	55.5	9	6.99	30	60.8	13	10.77	29	14.4	6	54.45	38	20.5	19
Mar. 1.7	60.38	74	56.4	14	7.29	27	62.1	11	11.06	27	13.8	3	54.83	36	22.4	20
11.7	61.12	63	57.8	20	7.56	24	63.2	9	11.33	24	13.5	2	55.19	32	24.4	20
21.6	61.75	52	59.8	25	7.80	22	64.1	7	11.57	21	13.7	6	55.51	28	26.4	21
31.6	62.27	39	62.3	28	8.02	19	64.8	5	11.78	18	14.3	9	55.79	25	28.5	20
Apr. 10.6	62.66	25	65.1	30	8.21	16	65.3	2	11.96	15	15.2	11	56.04	21	30.5	20
20.5	62.91	10	68.1	31	8.37	13	65.5	1	12.11	11	16.3	14	56.25	17	32.5	20
30.5	63.01	4	71.2	32	8.50	10	65.6	0	12.22	9	17.7	15	56.42	13	34.5	18
May 10.5	62.97	17	74.4	30	8.60	8	65.6	1	12.31	5	19.2	15	56.55	9	36.3	17
20.5	62.80	30	77.4	28	8.68	4	65.5	2	12.36	2	20.7	16	56.64	5	38.0	16
30.4	62.50	42	80.2	25	8.72	2	65.3	3	12.38	0	22.3	15	56.69	1	39.6	13
June 9.4	62.08	52	82.7	22	8.74	1	65.0	4	12.38	3	23.8	14	56.70	3	40.9	12
19.4	61.56	60	84.9	17	8.73	4	64.6	4	12.35	5	25.2	13	56.67	6	42.1	9
29.4	60.96	68	86.6	13	8.69	6	64.2	4	12.30	9	26.5	11	56.61	10	43.0	7
July 9.3	60.28	74	87.9	8	8.63	9	63.8	4	12.21	10	27.6	9	56.51	14	43.7	4
19.3	59.54	77	88.7	2	8.54	11	63.4	5	12.11	12	28.5	7	56.37	16	44.1	1
29.3	58.77	79	88.9	3	8.43	12	62.9	4	11.99	13	29.2	4	56.21	18	44.2	2
Aug. 8.2	57.98	80	88.6	8	8.31	13	62.5	5	11.86	15	29.6	2	56.03	19	44.0	5
18.2	57.18	77	87.8	14	8.18	13	62.0	4	11.71	14	29.8	1	55.84	19	43.5	8
28.2	56.41	74	86.4	18	8.05	13	61.6	4	11.57	14	29.7	4	55.65	19	42.7	10
Sept. 7.2	55.67	69	84.6	23	7.92	12	61.2	3	11.43	13	29.3	6	55.46	17	41.7	13
17.1	54.98	61	82.3	27	7.80	9	60.9	2	11.30	11	28.7	9	55.29	13	40.4	14
27.1	54.37	51	79.6	31	7.71	7	60.7	1	11.19	7	27.8	12	55.16	10	39.0	15
Oct. 7.1	53.86	41	76.5	34	7.64	2	60.6	1	11.12	4	26.6	15	55.06	4	37.5	16
17.0	53.45	28	73.1	37	7.62	1	60.7	3	11.08	0	25.1	17	55.02	2	35.9	15
27.0	53.17	15	69.4	38	7.63	7	61.0	4	11.08	4	23.4	20	55.04	8	34.4	14
Nov. 6.0	53.02	0	65.6	39	7.70	11	61.4	7	11.12	10	21.4	22	55.12	15	33.0	13
16.0	53.02	16	61.7	38	7.81	17	62.1	9	11.22	15	19.2	24	55.27	21	31.7	10
25.9	53.18	30	57.9	37	7.98	22	63.0	12	11.37	19	16.8	25	55.48	28	30.7	6
Dec. 5.9	53.48	45	54.2	35	8.20	25	64.2	13	11.56	24	14.3	25	55.76	33	30.1	4
15.9	53.93	58	50.7	32	8.45	29	65.5	16	11.80	28	11.8	25	56.09	37	29.7	0
25.9	54.51	69	47.5	27	8.74	32	67.1	16	12.08	30	9.3	25	56.46	40	29.7	4
35.8	55.20		44.8		9.06		68.7		12.38		6.8		56.86		30.1	
Sec δ, Tan δ	3.742		+3.606		1.019		−0.196		1.034		+0.264		1.362		−0.926	
Mean Place	56ˢ.673		84″.98		5ˢ.929		47″.57		9ˢ.604		35″.80		53ˢ.439		18″.06	
$D'_\psi a$, $D_\omega a$	−0.06		+0.18		0.00		−0.01		0.00		+0.01		+0.02		−0.04	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Libræ. Var. 4.8–6.2				β Boötis. Mag. 3.6				γ Scorpii. Mag. 3.4				ψ Boötis. Mag. 4.7			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 14 56		° ′ − 8 10		h m 14 58		° ′ +40 43		h m 14 59		° ′ −24 56		h m 15 0		° ′ +27 16	
	s		″		s		″		s		″		s		″	
Jan. 0.8	21.90		47.9		41.89		26.3		1.22		41.7		45.14		40.7	
10.8	22.22	32	49.7	18	42.24	35	23.6	27	1.57	35	42.9	12	45.46	32	38.1	26
20.8	22.56	34	51.5	18	42.61	37	21.4	22	1.93	36	44.3	14	45.79	33	35.9	22
30.8	22.89	33	53.2	17	42.99	38	19.6	18	2.29	36	45.7	14	46.14	35	34.0	19
Feb. 9.7	23.22	33	54.8	16	43.37	38	18.4	12	2.65	36	47.3	16	46.48	34	32.7	13
19.7	23.54	32	56.2	14	43.74	37	17.9	5	2.99	34	48.9	16	46.81	33	31.8	9
Mar. 1.7	23.83	29	57.4	12	44.09	35	17.9	0	3.32	33	50.4	15	47.12	31	31.5	3
11.7	24.10	27	58.4	10	44.40	31	18.5	6	3.61	29	51.9	15	47.41	29	31.7	2
21.6	24.35	25	59.1	7	44.68	28	19.7	12	3.88	27	53.3	14	47.66	25	32.3	6
31.6	24.57	22	59.7	6	44.93	25	21.3	16	4.13	25	54.6	13	47.89	23	33.4	11
Apr. 10.6	24.76	19	60.0	3	45.13	20	23.3	20	4.34	21	55.8	12	48.08	19	34.9	15
20.5	24.92	16	60.1	1	45.29	16	25.6	23	4.52	18	56.8	10	48.23	15	36.7	18
30.5	25.05	13	60.0	1	45.40	11	28.1	25	4.67	15	57.7	9	48.35	12	38.7	20
May 10.5	25.16	11	59.8	2	45.47	7	30.7	26	4.79	12	58.5	8	48.43	8	40.7	20
20.5	25.23	7	59.5	3	45.50	3	33.3	26	4.88	9	59.2	7	48.48	5	42.9	22
30.4	25.28	5	59.1	4	45.49	1	35.8	25	4.94	6	59.8	6	48.50	2	45.0	21
June 9.4	25.30	2	58.7	4	45.44	5	38.2	24	4.96	2	60.2	4	48.49	1	47.0	20
19.4	25.29	1	58.2	5	45.35	9	40.3	21	4.96	0	60.5	3	48.44	5	48.9	19
29.4	25.25	4	57.7	5	45.23	12	42.2	19	4.92	4	60.7	2	48.36	8	50.5	16
July 9.3	25.19	6	57.2	5	45.08	15	43.7	15	4.85	7	60.7	0	48.26	10	51.8	13
19.3	25.11	8	56.7	5	44.91	17	44.8	11	4.76	9	60.6	1	48.14	12	52.9	11
29.3	25.00	11	56.2	5	44.71	20	45.5	7	4.64	12	60.4	2	47.99	15	53.7	8
Aug. 8.2	24.88	12	55.7	5	44.50	21	45.8	3	4.51	13	60.1	3	47.83	16	54.1	4
18.2	24.75	13	55.3	4	44.29	21	45.6	2	4.36	15	59.6	5	47.66	17	54.2	1
28.2	24.62	13	54.9	4	44.07	22	45.1	5	4.21	15	59.0	6	47.49	17	53.9	3
Sept. 7.2	24.49	13	54.6	3	43.86	21	44.1	10	4.07	14	58.3	7	47.32	17	53.2	7
17.1	24.37	12	54.4	2	43.66	20	42.6	15	3.94	13	57.6	7	47.17	15	52.2	10
27.1	24.27	10	54.3	1	43.49	17	40.7	19	3.83	11	56.8	8	47.03	14	50.9	13
Oct. 7.1	24.20	7	54.4	1	43.35	14	38.5	22	3.76	7	56.1	7	46.93	10	49.2	17
17.1	24.17	3	54.6	2	43.25	10	35.9	26	3.72	4	55.4	7	46.86	7	47.1	21
27.0	24.18	1	55.0	4	43.21	4	33.0	29	3.74	2	54.9	5	46.84	2	44.8	23
Nov. 6.0	24.24	6	55.7	7	43.22	1	29.8	32	3.80	6	54.5	4	46.86	2	42.2	26
16.0	24.35	11	56.5	8	43.29	7	26.5	33	3.92	12	54.3	2	46.94	8	39.4	28
25.9	24.51	16	57.6	11	43.41	12	23.1	34	4.10	18	54.3	0	47.07	13	36.5	29
Dec. 5.9	24.72	21	58.9	13	43.60	19	19.7	34	4.33	23	54.6	3	47.26	19	33.5	30
15.9	24.97	25	60.4	15	43.85	25	16.3	34	4.60	27	55.2	6	47.49	23	30.5	30
25.9	25.25	28	62.0	16	44.14	29	13.1	32	4.91	31	56.1	9	47.76	27	27.6	29
35.8	25.56	31	63.7	17	44.47	33	10.2	29	5.25	34	57.1	10	48.07	31	24.8	28
Sec δ, Tan δ	1.010		−0.144		1.319		+0.861		1.103		−0.465		1.125		+0.516	
Mean Place	22ˢ.490		41″.91		42ˢ.402		45″.32		1ˢ.997		40″.36		45ˢ.623		56″.64	
$D'_\psi a$, $D_\omega a$	0.00		−0.01		−0.02		+0.04		+0.01		−0.02		−0.01		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**c Boötis.** Mag. 5.0				**ζ Lupi.** Mag. 3.5				**ι Libræ.** Mag. 4.7				**γ Triang. Aust.** Mag. 3.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 3		+25 11		15 6		−51 46		15 7		−19 28		15 10		−68 21	
	s		″		s		″		s		″		s		″	
Jan. 0.9	30.92		57.1		4.46		16.4		18.20		4.4		48.90		39.5	
10.8	31.24	32	54.5	26	4.94	48	16.5	1	18.54	34	5.8	14	49.62	72	39.0	5
20.8	31.57	33	52.3	22	5.43	49	17.0	5	18.89	35	7.3	15	50.38	76	39.0	0
30.8	31.91	34	50.4	19	5.93	50	18.0	10	19.24	35	8.8	15	51.16	78	39.5	5
Feb. 9.7	32.25	34	49.0	14	6.42	49	19.2	12	19.58	34	10.3	15	51.94	78	40.4	9
19.7	32.58	33	48.1	9	6.90	48	20.8	16	19.92	34	11.8	15	52.69	75	41.8	14
Mar. 1.7	32.89	31	47.7	4	7.35	45	22.6	18	20.23	31	13.2	14	53.41	72	43.6	18
11.7	33.17	28	47.8	1	7.77	42	24.6	20	20.52	29	14.5	13	54.09	68	45.7	21
21.6	33.43	26	48.4	6	8.16	39	26.7	21	20.79	27	15.6	11	54.71	62	48.0	23
31.6	33.65	22	49.4	10	8.50	34	29.0	23	21.03	24	16.6	10	55.27	56	50.6	26
Apr. 10.6	33.84	19	50.8	14	8.81	31	31.3	23	21.24	21	17.4	8	55.75	48	53.4	28
20.6	34.00	16	52.4	16	9.07	26	33.6	23	21.43	19	18.1	7	56.16	41	56.3	29
30.5	34.13	13	54.3	19	9.28	21	35.9	23	21.58	15	18.7	6	56.49	33	59.3	30
May 10.5	34.22	9	56.3	20	9.45	17	38.2	23	21.70	12	19.2	5	56.74	25	62.2	29
20.5	34.27	5	58.4	21	9.57	12	40.3	21	21.80	10	19.5	3	56.90	16	65.1	29
30.4	34.29	2	60.4	20	9.64	7	42.3	20	21.86	6	19.7	2	56.97	7	67.9	28
June 9.4	34.28	1	62.4	20	9.66	2	44.2	19	21.89	3	19.8	1	56.95	2	70.5	26
19.4	34.24	4	64.2	18	9.62	4	45.8	16	21.89	0	19.9	1	56.85	10	72.8	23
29.4	34.18	6	65.8	16	9.54	8	47.2	14	21.87	2	19.9	0	56.66	19	74.9	21
July 9.3	34.08	10	67.1	13	9.42	12	48.2	10	21.81	6	19.7	2	56.40	26	76.6	17
19.3	33.96	12	68.2	11	9.26	16	49.0	8	21.73	8	19.5	2	56.06	34	77.9	13
29.3	33.82	14	69.0	8	9.06	20	49.4	4	21.62	11	19.3	2	55.68	38	78.7	8
Aug. 8.3	33.67	15	69.4	4	8.83	23	49.5	1	21.49	13	18.9	4	55.25	43	79.1	4
18.2	33.51	16	69.5	1	8.59	24	49.2	3	21.35	14	18.5	4	54.79	46	79.0	1
28.2	33.34	17	69.3	2	8.34	25	48.5	7	21.21	14	18.0	5	54.33	46	78.4	6
Sept. 7.2	33.18	16	68.7	6	8.11	23	47.4	11	21.07	14	17.4	6	53.88	45	77.4	10
17.1	33.03	15	67.8	9	7.89	22	46.1	13	20.94	13	16.9	5	53.47	41	75.9	15
27.1	32.89	14	66.5	13	7.71	18	44.5	16	20.83	11	16.4	5	53.12	35	74.0	19
Oct. 7.1	32.79	10	64.9	16	7.57	14	42.7	18	20.75	8	15.9	5	52.85	27	71.8	22
17.1	32.73	6	63.0	19	7.49	8	40.8	19	20.71	4	15.5	4	52.67	18	69.4	24
27.0	32.70	3	60.7	23	7.49	0	38.9	19	20.72	1	15.2	3	52.61	6	66.8	26
Nov. 6.0	32.73	3	58.2	25	7.55	6	37.0	19	20.77	5	15.2	0	52.67	6	64.2	26
16.0	32.81	8	55.5	27	7.70	15	35.2	18	20.88	11	15.3	1	52.85	18	61.7	25
26.0	32.94	13	52.7	28	7.92	22	33.7	15	21.04	16	15.7	4	53.16	31	59.3	24
Dec. 5.9	33.12	18	49.8	29	8.21	29	32.4	13	21.25	21	16.3	6	53.58	42	57.3	20
15.9	33.35	23	46.8	30	8.57	36	31.5	9	21.50	25	17.1	8	54.11	53	55.5	18
25.9	33.62	27	43.9	29	8.99	42	31.0	5	21.80	30	18.1	10	54.73	62	54.2	13
35.8	33.92	30	41.2	27	9.44	45	30.9	1	22.12	32	19.4	13	55.42	69	53.4	8
Sec δ, Tan δ	1.105		+0.471		1.616		−1.269		1.061		−0.353		2.713		−2.521	
Mean Place	$31^{s}.422$		$72''.50$		$5^{s}.942$		$21''.08$		$18^{s}.950$		$1''.29$		$51^{s}.701$		$46''.61$	
D′ψ a, Dω a	−0.01		+0.02		+0.02		−0.06		+0.01		−0.02		+0.05		−0.11	
Dψ δ, Dω δ	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**8 Serpentis.** Mag. 5.4				**δ Boötis.** Mag. 3.5				**β Libræ.** Mag. 2.7				**γ Ursæ Minoris.** Mag. 3.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 10		+ 5 15		15 12		+33 37		15 12		− 9 3		15 20		+72 7	
	s		″		s		″		s		″		s		″	
Jan. 0.9	54.19		18.6		1.57		48.8		21.95		64.7		49.62		61.3	
10.8	54.50	31	16.5	21	1.89	32	46.1	27	22.27	32	66.4	17	50.23	61	58.6	27
20.8	54.82	32	14.5	20	2.24	35	43.8	23	22.60	33	68.1	17	50.92	69	56.3	23
30.8	55.14	32	12.7	18	2.60	36	41.9	19	22.93	33	69.7	16	51.67	75	54.7	16
Feb. 9.7	55.47	33	11.2	15	2.95	35	40.5	14	23.26	33	71.2	15	52.44	77	53.8	9
19.7	55.78	31	10.0	12	3.30	35	39.7	8	23.58	32	72.6	14	53.21	77	53.6	2
Mar. 1.7	56.07	29	9.1	9	3.63	33	39.5	2	23.88	30	73.8	12	53.96	75	54.0	4
11.7	56.35	28	8.5	6	3.93	30	39.8	3	24.17	29	74.8	10	54.65	69	55.1	11
21.6	56.60	25	8.3	2	4.21	28	40.6	8	24.43	26	75.5	7	55.27	62	56.7	16
31.6	56.82	22	8.5	2	4.45	24	41.9	13	24.66	23	76.0	5	55.80	53	58.9	22
Apr. 10.6	57.02	20	8.9	4	4.65	20	43.6	17	24.86	20	76.3	3	56.22	42	61.5	26
20.6	57.19	17	9.6	7	4.82	17	45.6	20	25.04	18	76.5	2	56.53	31	64.4	29
30.5	57.32	13	10.4	8	4.95	13	47.9	23	25.19	15	76.4	1	56.72	19	67.5	31
May 10.5	57.43	11	11.4	10	5.05	10	50.3	24	25.31	12	76.2	2	56.79	7	70.7	32
20.5	57.51	8	12.6	12	5.10	5	52.7	24	25.40	9	75.9	3	56.74	5	73.9	32
30.4	57.56	5	13.7	11	5.12	2	55.1	24	25.46	6	75.5	4	56.57	17	76.9	30
June 9.4	57.59	3	14.9	12	5.10	2	57.4	23	25.49	3	75.1	4	56.29	28	79.7	28
19.4	57.58	1	16.0	11	5.05	5	59.4	20	25.50	1	74.6	5	55.91	38	82.2	25
29.4	57.54	4	17.0	10	4.96	9	61.3	19	25.47	3	74.2	4	55.44	47	84.3	21
July 9.3	57.48	6	18.0	10	4.85	11	62.8	15	25.42	5	73.7	5	54.90	54	86.0	17
19.3	57.40	8	18.8	8	4.71	14	64.0	12	25.34	8	73.2	5	54.30	60	87.2	12
29.3	57.29	11	19.5	7	4.54	17	64.9	9	25.24	10	72.7	5	53.65	65	87.9	7
Aug. 8.3	57.17	12	20.0	5	4.36	18	65.4	5	25.12	12	72.3	4	52.96	69	88.1	2
18.2	57.03	14	20.3	3	4.17	19	65.5	1	24.99	13	71.8	5	52.26	70	87.8	3
28.2	56.89	14	20.5	2	3.98	19	65.2	3	24.85	14	71.5	3	51.56	70	86.9	9
Sept. 7.2	56.75	14	20.5	0	3.79	19	64.4	8	24.71	14	71.2	3	50.88	68	85.5	14
17.1	56.62	13	20.3	2	3.61	18	63.3	11	24.58	13	71.0	2	50.23	65	83.6	19
27.1	56.51	11	19.8	5	3.45	16	61.8	15	24.47	11	70.8	2	49.63	60	81.3	23
Oct. 7.1	56.42	9	19.1	7	3.32	13	59.9	19	24.39	8	70.8	0	49.10	53	78.6	27
17.1	56.37	5	18.2	9	3.23	9	57.6	23	24.35	4	71.0	2	48.67	43	75.5	31
27.0	56.36	1	17.0	12	3.18	5	55.1	25	24.35	0	71.4	4	48.34	33	72.0	35
Nov. 6.0	56.40	4	15.6	14	3.18	0	52.3	28	24.39	4	71.9	5	48.12	22	68.4	36
16.0	56.49	9	14.0	16	3.24	6	49.2	31	24.48	9	72.7	8	48.03	9	64.6	38
26.0	56.62	13	12.2	18	3.36	12	46.1	31	24.63	15	73.7	10	48.08	5	60.7	39
Dec. 5.9	56.80	18	10.2	20	3.53	17	42.8	33	24.82	19	74.9	12	48.26	18	56.9	38
15.9	57.03	23	8.0	22	3.75	22	39.6	32	25.06	24	76.2	13	48.57	31	53.3	36
25.9	57.30	27	5.9	21	4.02	27	36.5	31	25.33	27	77.7	15	49.01	44	49.9	34
35.8	57.59	29	3.7	22	4.33	31	33.6	29	25.63	30	79.4	17	49.57	56	46.9	30
Sec δ, Tan δ	1.004		+0.092		1.201		+0.665		1.013		−0.160		3.260		+3.103	
Mean Place	$54^{s}.767$		28″.84		$2^{s}.148$		66″.18		$22^{s}.618$		58″.50		$51^{s}.406$		83″.93	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		0.00		−0.01		+0.03		0.00		−0.01		−0.06		+0.13	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**μ Boötis pr.** Mag. 4.5				**τ^1 Serpentis.** Mag. 5.5				**ι Draconis.** Mag. 3.5				**ρ Octantis.** Mag. 5.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 21		+37 40		15 21		+15 43		15 22		+59 15		15 23		−84 10	
	s		″		s		″		s		″		s		″	
Jan. 0.9	13.83		23.6		47.37		34.1		59.93		39.5		5.26		45.1	
10.8	14.15	32	20.8	28	47.67	30	31.7	24	60.36	43	36.7	28	7.56	230	43.9	12
20.8	14.50	35	18.4	24	47.99	32	29.5	22	60.82	46	34.3	24	10.03	247	43.3	6
30.8	14.87	37	16.5	19	48.32	33	27.6	19	61.31	49	32.5	18	12.60	257	43.2	1
Feb. 9.8	15.23	36	15.1	14	48.65	33	26.0	16	61.82	51	31.3	12	15.20	260	43.7	5
19.7	15.59	36	14.3	8	48.96	31	24.9	11	62.32	50	30.8	5	17.78	258	44.7	10
Mar. 1.7	15.93	34	14.1	2	49.27	31	24.2	7	62.80	48	31.0	2	20.28	250	46.2	15
11.7	16.25	32	14.4	3	49.55	28	24.0	2	63.25	45	31.9	9	22.64	236	48.1	19
21.6	16.54	29	15.3	9	49.81	26	24.2	2	63.66	41	33.3	14	24.82	218	50.4	23
31.6	16.80	26	16.8	15	50.04	23	24.8	6	64.01	35	35.3	20	26.79	197	53.1	27
Apr. 10.6	17.02	22	18.6	18	50.24	20	25.7	9	64.30	29	37.7	24	28.51	172	56.0	29
20.6	17.20	18	20.7	21	50.42	18	26.9	12	64.52	22	40.4	27	29.94	143	59.2	32
30.5	17.34	14	23.1	24	50.56	14	28.3	14	64.68	16	43.4	30	31.07	113	62.5	33
May 10.5	17.44	10	25.7	26	50.68	12	29.9	16	64.77	9	46.5	31	31.88	81	65.9	34
20.5	17.50	6	28.3	26	50.76	8	31.6	17	64.79	2	49.6	31	32.35	47	69.2	33
30.5	17.52	2	30.8	25	50.81	5	33.3	17	64.74	5	52.6	30	32.48	13	72.5	33
June 9.4	17.50	2	33.3	25	50.83	2	35.0	17	64.63	11	55.4	28	32.26	22	75.7	32
19.4	17.44	6	35.5	22	50.82	1	36.6	16	64.46	17	57.9	25	31.72	54	78.6	29
29.4	17.35	9	37.5	20	50.78	4	38.0	14	64.24	22	60.1	22	30.86	86	81.2	26
July 9.3	17.22	13	39.2	17	50.71	7	39.3	13	63.97	27	61.9	18	29.70	116	83.5	23
19.3	17.07	15	40.6	14	50.62	9	40.4	11	63.65	32	63.3	14	28.29	141	85.3	18
29.3	16.90	17	41.5	9	50.50	12	41.2	8	63.31	34	64.2	9	26.68	161	86.7	14
Aug. 8.3	16.70	20	42.0	5	50.36	14	41.8	6	62.94	37	64.6	4	24.91	177	87.5	8
18.2	16.49	21	42.2	2	50.22	14	42.1	3	62.56	38	64.4	2	23.06	185	87.8	3
28.2	16.27	22	41.9	3	50.06	16	42.2	1	62.17	39	63.8	6	21.18	188	87.5	3
Sept. 7.2	16.06	21	41.2	7	49.91	15	42.0	2	61.79	38	62.7	11	19.35	183	86.6	9
17.2	15.86	20	40.0	12	49.76	15	41.4	6	61.43	36	61.0	17	17.64	171	85.2	14
27.1	15.68	18	38.4	16	49.63	13	40.6	8	61.10	33	58.9	21	16.14	150	83.3	19
Oct. 7.1	15.53	15	36.5	19	49.53	10	39.5	11	60.81	29	56.4	25	14.91	123	81.0	23
17.1	15.42	11	34.2	23	49.46	7	38.1	14	60.58	23	53.5	29	14.01	90	78.3	27
27.0	15.35	7	31.5	27	49.43	3	36.4	17	60.41	17	50.2	33	13.49	52	75.4	29
Nov. 6.0	15.33	2	28.6	29	49.44	1	34.5	19	60.32	9	46.7	35	13.38	11	72.4	30
16.0	15.37	4	25.4	32	49.51	7	32.3	22	60.31	1	43.0	37	13.70	32	69.3	31
26.0	15.48	11	22.1	33	49.63	12	29.9	24	60.38	7	39.2	38	14.46	76	66.3	30
Dec. 5.9	15.64	16	18.8	33	49.79	16	27.4	25	60.54	16	35.5	37	15.64	118	63.6	27
15.9	15.85	21	15.4	34	50.00	21	24.8	26	60.78	24	31.8	37	17.20	156	61.2	24
25.9	16.11	26	12.2	32	50.26	26	22.3	25	61.10	32	28.3	35	19.09	189	59.2	20
35.9	16.41	30	9.3	29	50.54	28	19.8	25	61.48	38	25.2	31	21.25	216	57.7	15
Sec δ, Tan δ	1.263		+0.772		1.039		+0.281		1.957		+1.682		9.870		−9.819	
Mean Place	14ˢ.496		41″.66		47ˢ.983		47″.10		60ˢ.992		60″.98		16ˢ.56*		52″.70	
D′ψ α, Dω α	−0.02		+0.03		−0.01		+0.01		−0.03		+0.07		+0.20		−0.41	
Dψ δ, Dω δ	−0.3		−0.8		−0.3		−0.8		−0.3		−0.8		−0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**32 Libræ.**				**β Coronæ Borealis.**				**ν^1 Boötis.**				**γ Lupi (*mean*).**			
	Mag. 5.9				Mag. 3.7				Mag. 5.2				Mag. 3.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 23		−16 25		15 24		+29 23		15 27		+41 6		15 29		−40 52	
	s		″		s		″		s		″		s		″	
Jan. 0.9	23.44		7.2		16.36		49.3		49.67		73.8		23.06		42.1	
10.8	23.76	32	8.6	14	16.67	31	46.7	26	50.00	33	71.0	28	23.45	39	42.4	3
20.8	24.10	34	10.0	14	17.00	33	44.3	24	50.35	35	68.5	25	23.86	41	43.0	6
30.8	24.44	34	11.5	15	17.34	34	42.4	19	50.72	37	66.6	19	24.28	42	43.9	9
Feb. 9.8	24.78	34	12.9	14	17.68	34	40.9	15	51.10	38	65.1	15	24.70	42	45.0	11
		33		14		34		10		37		8		41		13
19.7	25.11		14.3		18.02		39.9		51.47		64.3		25.11		46.3	
Mar. 1.7	25.43	32	15.5	12	18.34	32	39.5	4	51.83	36	64.1	2	25.50	39	47.8	15
11.7	25.73	30	16.6	11	18.64	30	39.6	1	52.17	34	64.5	4	25.88	38	49.3	15
21.6	26.00	27	17.6	10	18.92	28	40.3	7	52.47	30	65.5	10	26.22	34	51.0	17
31.6	26.25	25	18.4	8	19.16	24	41.4	11	52.74	27	67.0	15	26.54	32	52.6	16
		22		6		22		15		24		19		28		17
Apr. 10.6	26.47		19.0		19.38		42.9		52.98		68.9		26.82		54.3	
20.6	26.66	19	19.5	5	19.56	18	44.7	18	53.17	19	71.1	22	27.07	25	56.0	17
30.5	26.83	17	19.8	3	19.70	14	46.8	21	53.32	15	73.6	25	27.29	22	57.7	17
May 10.5	26.97	14	20.0	2	19.81	11	49.0	22	53.42	10	76.3	27	27.46	17	59.3	16
20.5	27.08	11	20.1	1	19.88	7	51.3	23	53.48	6	79.0	27	27.60	14	60.8	15
		7		1		3		23		2		27		10		15
30.5	27.15		20.2		19.91		53.6		53.50		81.7		27.70		62.3	
June 9.4	27.20	5	20.1	1	19.91	0	55.8	22	53.48	2	84.3	26	27.76	6	63.6	13
19.4	27.21	1	20.0	1	19.88	3	57.9	21	53.42	6	86.7	24	27.77	1	64.7	11
29.4	27.20	1	19.8	2	19.82	6	59.7	18	53.32	10	88.8	21	27.74	3	65.7	10
July 9.3	27.15	5	19.6	2	19.72	10	61.3	16	53.19	13	90.5	17	27.68	6	66.5	8
		7		3		12		13		17		15		11		5
19.3	27.08		19.3		19.60		62.6		53.02		92.0		27.57		67.0	
29.3	26.98	10	19.0	3	19.45	15	63.6	10	52.83	19	93.0	10	27.44	13	67.4	4
Aug. 8.3	26.85	13	18.7	3	19.28	17	64.2	6	52.62	21	93.6	6	27.27	17	67.4	0
18.2	26.72	13	18.3	4	19.10	18	64.5	3	52.39	23	93.8	2	27.09	18	67.2	2
28.2	26.57	15	17.9	4	18.92	18	64.3	2	52.16	23	93.5	3	26.89	20	66.7	5
		14		5		19		5		23		8		19		7
Sept. 7.2	26.43		17.4		18.73		63.8		51.93		92.7		26.70		66.0	
17.2	26.30	13	17.0	4	18.56	17	62.9	9	51.71	22	91.6	11	26.52	18	65.1	9
27.1	26.18	12	16.6	4	18.40	16	61.6	13	51.51	20	89.9	17	26.36	16	63.9	12
Oct. 7.1	26.09	9	16.3	3	18.27	13	60.0	16	51.34	17	87.9	20	26.23	13	62.6	13
17.1	26.03	6	16.1	2	18.17	10	58.0	20	51.20	14	85.5	24	26.15	8	61.3	13
		1		1		5		23		8		27		2		14
27.0	26.02		16.0		18.12		55.7		51.12		82.8		26.13		59.9	
Nov. 6.0	26.06	4	16.1	1	18.12	0	53.1	26	51.09	3	79.8	30	26.16	3	58.5	14
16.0	26.15	9	16.4	3	18.17	5	50.3	28	51.12	3	76.5	33	26.26	10	57.3	12
26.0	26.29	14	16.9	5	18.27	10	47.3	30	51.21	9	73.1	34	26.43	17	56.3	10
Dec. 5.9	26.48	19	17.6	7	18.43	16	44.2	31	51.36	15	69.7	34	26.65	22	55.5	8
		24		9		21		31		20		34		29		5
15.9	26.72		18.5		18.64		41.1		51.56		66.3		26.94		55.0	
25.9	27.00	28	19.6	11	18.89	25	38.1	30	51.82	26	63.0	33	27.27	33	54.8	2
35.9	27.30	30	20.9	13	19.18	29	35.3	28	52.13	31	59.9	31	27.64	37	54.9	1
Sec δ, Tan δ	1.042		−0.295		1.148		+0.563		1.327		+0.873		1.323		−0.866	
Mean Place	24^{s}.217		2″.62		17^{s}.001		65″.63		50^{s}.416		92″.43		24^{s}.269		43″.17	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.01		−0.01		−0.01		+0.02		−0.02		+0.04		+0.02		−0.04	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		−0.8		−0.3		−0.8		−0.2		−0.8		−0.2		−0.8	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Libræ. Mag. 4.0				α Coronæ Borealis. Mag. 2.3				ζ Cor. Bor. *seq.* Mag. 5.1				α Serpentis. Mag. 2.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 30		−14 30		15 31		+26 59		15 36		+36 54		15 40		+ 6 41	
	s		″		s		″		s		″		s		″	
Jan. 0.9	42.01		17.2		2.10		56.8		7.60		34.5		1.13		33.0	
10.8	42.33	32	18.6	14	2.40	30	54.1	27	7.92	32	31.6	29	1.42	29	30.8	22
20.8	42.66	33	20.0	14	2.72	32	51.8	23	8.26	34	29.1	25	1.73	31	28.8	20
30.8	43.00	34	21.5	15	3.06	34	49.8	20	8.61	35	27.1	20	2.05	32	27.0	18
Feb. 9.8	43.33	33	22.9	14	3.40	34	48.3	15	8.97	36	25.6	15	2.37	32	25.5	15
19.7	43.66	33	24.2	13	3.73	33	47.2	11	9.33	36	24.6	10	2.69	32	24.3	12
Mar. 1.7	43.98	32	25.4	12	4.05	32	46.7	5	9.67	34	24.3	3	2.99	30	23.4	9
11.7	44.28	30	26.4	10	4.35	30	46.7	0	10.00	33	24.5	2	3.28	29	22.9	5
21.7	44.55	27	27.3	9	4.63	28	47.3	6	10.30	30	25.3	8	3.55	27	22.7	2
31.6	44.80	25	28.0	7	4.88	25	48.3	10	10.56	26	26.6	13	3.79	24	22.9	2
Apr. 10.6	45.03	23	28.5	5	5.09	21	49.7	14	10.80	24	28.3	17	4.01	22	23.5	6
20.6	45.23	20	28.8	3	5.28	19	51.4	17	10.99	19	30.4	21	4.21	20	24.3	8
30.5	45.40	17	29.0	2	5.43	15	53.3	19	11.15	16	32.8	24	4.37	16	25.3	10
May 10.5	45.54	14	29.1	1	5.55	12	55.5	22	11.27	12	35.3	25	4.51	14	26.4	11
20.5	45.66	12	29.1	0	5.63	8	57.7	22	11.35	8	37.9	26	4.61	10	27.7	13
30.5	45.74	8	29.0	1	5.67	4	59.9	22	11.38	3	40.6	27	4.69	8	29.0	13
June 9.4	45.79	5	28.8	2	5.69	2	62.1	22	11.38	0	43.1	25	4.73	4	30.3	13
19.4	45.81	2	28.6	2	5.66	3	64.1	20	11.34	4	45.4	23	4.75	2	31.6	13
29.4	45.80	1	28.3	3	5.61	5	65.9	18	11.26	8	47.5	21	4.73	2	32.8	12
July 9.4	45.76	4	28.0	3	5.53	8	67.5	16	11.15	11	49.3	18	4.68	5	33.9	11
19.3	45.69	7	27.7	3	5.41	12	68.8	13	11.01	14	50.8	15	4.61	7	34.9	10
29.3	45.59	10	27.4	3	5.27	14	69.8	10	10.84	17	51.9	11	4.51	10	35.7	8
Aug. 8.3	45.48	11	27.0	4	5.11	16	70.5	7	10.64	20	52.6	7	4.39	12	36.3	6
18.2	45.34	14	26.6	4	4.94	17	70.8	3	10.44	20	52.9	3	4.25	14	36.7	4
28.2	45.20	14	26.2	4	4.76	18	70.8	0	10.22	22	52.7	2	4.10	15	36.9	2
Sept. 7.2	45.05	15	25.8	4	4.58	18	70.4	4	10.00	22	52.1	6	3.95	15	37.0	1
17.2	44.91	14	25.5	3	4.41	17	69.6	8	9.79	21	51.1	10	3.81	14	36.8	2
27.1	44.79	12	25.2	3	4.25	16	68.4	12	9.61	18	49.7	14	3.68	13	36.4	4
Oct. 7.1	44.70	9	25.0	2	4.12	13	66.9	15	9.45	16	47.9	18	3.57	11	35.7	7
17.1	44.64	6	24.8	2	4.03	9	65.0	19	9.32	13	45.7	22	3.50	7	34.8	9
27.1	44.62	2	24.9	1	3.97	6	62.9	21	9.23	9	43.2	25	3.46	4	33.6	12
Nov. 6.0	44.65	3	25.0	1	3.96	1	60.4	25	9.20	3	40.4	28	3.46	0	32.2	14
16.0	44.73	8	25.4	4	4.01	5	57.7	27	9.23	3	37.3	31	3.52	6	30.6	16
26.0	44.86	13	26.0	6	4.11	10	54.9	28	9.31	8	34.1	32	3.63	11	28.8	18
Dec. 5.9	45.04	18	26.8	8	4.26	15	51.9	30	9.45	14	30.8	33	3.78	15	26.8	20
15.9	45.27	23	27.8	10	4.46	20	48.9	30	9.65	20	27.4	34	3.98	20	24.7	21
25.9	45.54	27	29.0	12	4.71	25	45.9	30	9.89	24	24.2	32	4.22	24	22.5	22
35.9	45.84	30	30.3	13	4.99	28	43.1	28	10.18	29	21.2	30	4.49	27	20.4	21
Sec δ, Tan δ	1.033		−0.259		1.122		+0.509		1.251		+0.751		1.007		+0.117	
Mean Place	42ˢ.799		11″.88		2ˢ.773		72″.48		8ˢ.373		52″.07		1ˢ.843		43″.84	
D′ψ a, Dω a	+0.01		−0.01		−0.01		+0.02		−0.02		+0.03		0.00		0.00	
Dψ δ, Dω δ	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Serpentis. Mag. 3.7				κ Serpentis. Mag. 4.3				μ Serpentis. Mag. 3.6				12 H. Draconis. Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 42		+15 40		15 44		+18 23		15 45		− 3 10		15 45		+62 51	
	s		″		s		″		s		″		s		″	
Jan. 0.9	12.39		71.8		51.33		69.4		7.05		12.5		19.65		33.2	
10.9	12.68	29	69.4	24	51.62	29	66.9	25	7.34	29	14.3	18	20.07	42	30.2	30
20.8	12.99	31	67.2	22	51.93	31	64.6	23	7.66	32	16.0	17	20.54	47	27.6	26
30.8	13.31	32	65.2	20	52.25	32	62.7	19	7.98	32	17.6	16	21.06	52	25.6	20
Feb. 9.8	13.64	33	63.7	15	52.58	33	61.1	16	8.30	32	19.1	15	21.60	54	24.3	13
19.7	13.96	32	62.5	12	52.90	32	59.9	12	8.62	32	20.3	12	22.15	55	23.6	7
Mar. 1.7	14.26	30	61.7	8	53.21	31	59.2	7	8.93	31	21.3	10	22.69	54	23.5	1
11.7	14.56	30	61.4	3	53.50	29	59.0	2	9.22	29	22.0	7	23.20	51	24.2	7
21.7	14.83	27	61.6	2	53.78	28	59.2	2	9.49	27	22.5	5	23.66	46	25.5	13
31.6	15.07	24	62.1	5	54.03	25	59.8	6	9.74	25	22.6	1	24.08	42	27.3	18
Apr. 10.6	15.29	22	63.0	9	54.25	22	60.9	11	9.97	23	22.6	0	24.43	35	29.6	23
20.6	15.49	20	64.3	13	54.44	19	62.2	13	10.17	20	22.3	3	24.71	28	32.3	27
30.6	15.65	16	65.7	14	54.61	17	63.8	16	10.35	18	21.8	5	24.92	21	35.3	30
May 10.5	15.78	13	67.4	17	54.74	13	65.6	18	10.49	14	21.1	7	25.05	13	38.5	32
20.5	15.88	10	69.1	17	54.84	10	67.5	19	10.61	12	20.4	7	25.10	5	41.7	32
30.5	15.95	7	70.9	18	54.91	7	69.4	19	10.70	9	19.6	8	25.07	3	44.8	31
June 9.4	15.99	4	72.6	17	54.95	4	71.2	18	10.76	6	18.8	8	24.97	10	47.8	30
19.4	16.00	1	74.3	17	54.95	0	73.0	18	10.79	3	18.0	8	24.80	17	50.5	27
29.4	15.97	3	75.9	16	54.93	2	74.7	17	10.78	1	17.2	8	24.56	24	52.9	24
July 9.4	15.92	5	77.2	13	54.87	6	76.2	15	10.74	4	16.4	8	24.26	30	55.0	21
19.3	15.83	9	78.4	12	54.78	9	77.4	12	10.68	6	15.7	7	23.91	35	56.6	16
29.3	15.72	11	79.4	10	54.66	12	78.4	10	10.59	9	15.1	6	23.52	39	57.7	11
Aug. 8.3	15.59	13	80.1	7	54.53	13	79.1	7	10.47	12	14.6	5	23.10	42	58.4	7
18.2	15.44	15	80.5	4	54.37	16	79.6	5	10.34	13	14.2	4	22.65	45	58.6	2
28.2	15.28	16	80.6	1	54.21	16	79.7	1	10.20	14	13.9	3	22.19	46	58.2	4
Sept. 7.2	15.12	16	80.5	1	54.04	17	79.6	1	10.05	15	13.7	2	21.74	45	57.3	9
17.2	14.96	16	80.1	4	53.88	16	79.1	5	9.91	14	13.6	1	21.30	44	55.9	14
27.1	14.82	14	79.4	7	53.73	15	78.3	8	9.78	13	13.7	1	20.89	41	54.0	19
Oct. 7.1	14.70	12	78.4	10	53.61	12	77.2	11	9.67	11	14.0	3	20.52	37	51.7	23
17.1	14.61	9	77.1	13	53.51	10	75.8	14	9.60	7	14.4	4	20.21	31	48.9	28
27.1	14.56	5	75.5	16	53.46	5	74.1	17	9.56	4	15.0	6	19.96	25	45.8	31
Nov. 6.0	14.56	0	73.6	19	53.45	1	72.1	20	9.57	1	15.9	9	19.80	16	42.4	34
16.0	14.60	4	71.5	21	53.49	4	69.8	23	9.63	6	16.9	10	19.72	8	38.7	37
26.0	14.70	10	69.2	23	53.58	9	67.4	24	9.74	11	18.2	13	19.74	2	35.0	37
Dec. 5.9	14.85	15	66.7	25	53.72	14	64.8	26	9.90	16	19.6	14	19.85	11	31.1	39
15.9	15.04	19	64.2	25	53.91	19	62.2	26	10.10	20	21.1	15	20.05	20	27.4	37
25.9	15.28	24	61.6	26	54.14	23	59.5	27	10.34	24	22.8	17	20.35	30	23.9	35
35.9	15.55	27	59.2	24	54.41	27	56.9	26	10.62	28	24.6	18	20.72	37	20.6	33
Sec δ, Tan δ	1.039		+0.281		1.054		+0.333		1.002		−0.055		2.192		+1.951	
Mean Place	13ˢ.108		84″.84		52ˢ.065		83″.07		7ˢ.820		3″.93		21ˢ.146		54″.20	
D′ψ α, Dω α	−0.01		+0.01		−0.01		+0.01		0.00		0.00		−0.04		+0.07	
Dψ δ, Dω δ	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ε Serpentis.** Mag. 3.8				**ζ Ursæ Minoris.** Mag. 4.3				**β Triang. Aust.** Mag. 3.0				**λ Libræ.** Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 15 46		° ′ + 4 43		h m 15 46		° ′ +78 3		h m 15 47		° ′ −63 9		h m 15 48		° ′ −19 54	
	s		″		s		″		s		″		s		″	
Jan. 0.9	30.92	28	59.2	20	62.75	76	12.6	29	30.82	57	55.1	8	19.41	32	43.8	11
10.9	31.20	31	57.2	20	63.51	89	9.7	24	31.39	62	54.3	4	19.73	33	44.9	11
20.8	31.51	32	55.2	18	64.40	100	7.3	18	32.01	65	53.9	1	20.06	34	46.0	13
30.8	31.83	32	53.4	15	65.40	107	5.5	12	32.66	65	54.0	5	20.40	35	47.3	12
Feb. 9.8	32.15	31	51.9	12	66.47	109	4.3	5	33.31	65	54.5	9	20.75	34	48.5	12
19.7	32.46	31	50.7	9	67.56	109	3.8	2	33.96	63	55.4	12	21.09	33	49.7	12
Mar. 1.7	32.77	29	49.8	5	68.65	103	4.0	8	34.59	60	56.6	16	21.42	31	50.9	10
11.7	33.06	27	49.3	2	69.68	94	4.8	14	35.19	57	58.2	18	21.73	30	51.9	9
21.7	33.33	25	49.1	1	70.62	83	6.2	20	35.76	53	60.0	21	22.03	27	52.8	8
31.6	33.58	23	49.2	4	71.45	68	8.2	25	36.29	48	62.1	23	22.30	25	53.6	7
Apr. 10.6	33.81	20	49.6	7	72.13	52	10.7	28	36.77	41	64.4	24	22.55	22	54.3	5
20.6	34.01	17	50.3	10	72.65	35	13.5	30	37.18	36	66.8	25	22.77	19	54.8	5
30.6	34.18	14	51.3	10	73.00	16	16.5	32	37.54	30	69.3	26	22.96	17	55.3	3
May 10.5	34.32	11	52.3	12	73.16	2	19.7	32	37.84	23	71.9	26	23.13	14	55.6	2
20.5	34.43	9	53.5	13	73.14	20	22.9	31	38.07	15	74.5	25	23.27	10	55.8	2
30.5	34.52	5	54.8	12	72.94	37	26.0	29	38.22	8	77.0	25	23.37	7	56.0	1
June 9.4	34.57	2	56.0	12	72.57	53	28.9	27	38.30	0	79.5	23	23.44	4	56.1	1
19.4	34.59	1	57.2	12	72.04	68	31.6	23	38.30	7	81.8	20	23.48	0	56.2	0
29.4	34.58	4	58.4	10	71.36	81	33.9	20	38.23	14	83.8	18	23.48	3	56.2	1
July 9.4	34.54	7	59.4	9	70.55	91	35.9	15	38.09	21	85.6	14	23.45	6	56.1	1
19.3	34.47	10	60.3	8	69.64	100	37.4	10	37.88	26	87.0	11	23.39	9	56.0	2
29.3	34.37	12	61.1	6	68.64	106	38.4	5	37.62	31	88.1	7	23.30	12	55.8	2
Aug. 8.3	34.25	13	61.7	5	67.58	110	38.9	1	37.31	35	88.8	3	23.18	14	55.6	3
18.3	34.12	15	62.2	3	66.48	112	38.8	5	36.96	37	89.1	2	23.04	15	55.3	4
28.2	33.97	15	62.5	1	65.36	110	38.3	11	36.59	37	88.9	6	22.89	15	54.9	4
Sept. 7.2	33.82	14	62.6	2	64.26	106	37.2	15	36.22	36	88.3	11	22.74	15	54.5	4
17.2	33.68	14	62.4	3	63.20	101	35.7	21	35.86	32	87.2	14	22.59	14	54.1	5
27.1	33.54	11	62.1	6	62.19	91	33.6	24	35.54	27	85.8	18	22.45	11	53.6	4
Oct. 7.1	33.43	8	61.5	8	61.28	79	31.2	29	35.27	20	84.0	21	22.34	7	53.2	3
17.1	33.35	4	60.7	10	60.49	66	28.3	32	35.07	11	81.9	22	22.27	4	52.9	3
27.1	33.31	0	59.7	13	59.83	49	25.1	35	34.96	1	79.7	23	22.23	2	52.6	2
Nov. 6.0	33.31	6	58.4	15	59.34	31	21.6	36	34.95	8	77.4	24	22.25	6	52.4	0
16.0	33.37	10	56.9	17	59.03	13	18.0	38	35.03	20	75.0	23	22.31	12	52.4	2
26.0	33.47	15	55.2	18	58.90	8	14.2	37	35.23	29	72.7	20	22.43	17	52.6	4
Dec. 6.0	33.62	19	53.4	20	58.98	28	10.5	37	35.52	39	70.7	18	22.60	22	53.0	6
15.9	33.81	24	51.4	21	59.26	48	6.8	34	35.91	47	68.9	15	22.82	27	53.6	8
25.9	34.05	27	49.3	21	59.74	65	3.4	32	36.38	54	67.4	11	23.09	29	54.4	10
35.9	34.32		47.2		60.39		0.2		36.92		66.3		23.38		55.4	
Sec δ, Tan δ	1.003		+0.083		4.832		+4.727		2.216		−1.977		1.064		−0.362	
Mean Place	31ˢ.660		69″.71		66ˢ.299		34″.34		33ˢ.233		58″.87		20ˢ.318		39″.22	
D′ψ a, Dω a	0.00		0.00		−0.10		+0.17		+0.04		−0.07		+0.01		−0.01	
Dψ δ, Dω δ	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**γ Serpentis.** Mag. 3.9				**π Scorpii.** Mag. 3.0				**ε Coronæ Borealis.** Mag. 4.2				**δ Scorpii.** Mag. 2.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 15 52 s		° ′ +15 56 ″		h m 15 53 s		° ′ −25 52 ″		h m 15 54 s		° ′ +27 7 ″		h m 15 55 s		° ′ −22 22 ″	
Jan. 0.9	28.03	28	16.8	25	37.77	32	5.9	8	0.75	29	19.1	27	13.74	32	44.2	10
10.9	28.31	31	14.3	22	38.09	35	6.7	9	1.04	31	16.4	25	14.06	33	45.2	10
20.8	28.62	32	12.1	20	38.44	36	7.6	10	1.35	32	13.9	21	14.39	35	46.2	11
30.8	28.94	32	10.1	17	38.80	35	8.6	11	1.67	34	11.8	16	14.74	35	47.3	11
Feb. 9.8	29.26	32	8.4	12	39.15	36	9.7	12	2.01	33	10.2	11	15.09	35	48.4	12
19.7	29.58	31	7.2	8	39.51	35	10.9	11	2.34	32	9.1	7	15.44	34	49.6	11
Mar. 1.7	29.89	29	6.4	3	39.86	33	12.0	11	2.66	31	8.4	1	15.78	32	50.7	10
11.7	30.18	28	6.1	1	40.19	31	13.1	11	2.97	29	8.3	5	16.10	30	51.7	10
21.7	30.46	26	6.2	5	40.50	28	14.2	9	3.26	27	8.8	9	16.40	28	52.7	8
31.6	30.72	23	6.7	9	40.78	27	15.1	9	3.53	23	9.7	13	16.68	26	53.5	8
Apr. 10.6	30.95	20	7.6	12	41.05	24	16.0	8	3.76	21	11.0	17	16.94	23	54.3	6
20.6	31.15	17	8.8	14	41.29	20	16.8	8	3.97	17	12.7	20	17.17	21	54.9	5
30.6	31.32	14	10.2	16	41.49	18	17.6	6	4.14	14	14.7	22	17.38	18	55.4	5
May 10.5	31.46	11	11.8	18	41.67	15	18.2	6	4.28	10	16.9	23	17.56	14	55.9	3
20.5	31.57	8	13.6	18	41.82	12	18.8	5	4.38	7	19.2	23	17.70	12	56.2	3
30.5	31.65	5	15.4	17	41.94	8	19.3	5	4.45	4	21.5	22	17.82	8	56.5	3
June 9.4	31.70	2	17.1	17	42.02	4	19.8	3	4.49	1	23.7	22	17.90	4	56.8	2
19.4	31.72	2	18.8	16	42.06	1	20.1	3	4.48	3	25.9	20	17.94	1	57.0	1
29.4	31.70	5	20.4	14	42.07	3	20.4	2	4.45	8	27.9	17	17.95	3	57.1	0
July 9.4	31.65	8	21.8	12	42.04	6	20.6	1	4.37	10	29.6	15	17.92	6	57.1	0
19.3	31.57	11	23.0	10	41.98	10	20.7	0	4.27	13	31.1	12	17.86	9	57.1	1
29.3	31.46	13	24.0	7	41.88	12	20.7	1	4.14	16	32.3	9	17.77	12	57.0	2
Aug. 8.3	31.33	15	24.7	5	41.76	14	20.6	2	3.98	17	33.2	5	17.65	14	56.8	2
18.3	31.18	16	25.2	2	41.62	16	20.4	3	3.81	19	33.7	1	17.51	15	56.6	3
28.2	31.02	16	25.4	1	41.46	17	20.1	4	3.62	19	33.8	2	17.36	16	56.3	4
Sept. 7.2	30.86	16	25.3	4	41.29	16	19.7	6	3.43	18	33.6	6	17.20	15	55.9	5
17.2	30.70	15	24.9	8	41.13	14	19.1	6	3.25	17	33.0	10	17.05	14	55.4	5
27.1	30.55	13	24.1	10	40.99	12	18.5	6	3.08	15	32.0	14	16.91	12	54.9	5
Oct. 7.1	30.42	9	23.1	13	40.87	8	17.9	6	2.93	12	30.6	17	16.79	8	54.4	4
17.1	30.33	6	21.8	16	40.79	4	17.3	6	2.81	8	28.9	20	16.71	4	54.0	4
27.1	30.27	2	20.2	19	40.75	1	16.7	5	2.73	3	26.9	24	16.67	0	53.6	3
Nov. 6.0	30.25	4	18.3	21	40.76	6	16.2	3	2.70	2	24.5	26	16.67	6	53.3	2
16.0	30.29	9	16.2	23	40.82	12	15.9	2	2.72	7	21.9	28	16.73	12	53.1	0
26.0	30.38	13	13.9	25	40.94	17	15.7	0	2.79	13	19.1	29	16.85	16	53.1	2
Dec. 6.0	30.51	18	11.4	25	41.11	23	15.7	2	2.92	17	16.2	30	17.01	22	53.3	4
15.9	30.69	23	8.9	26	41.34	27	15.9	4	3.09	22	13.2	30	17.23	26	53.7	7
25.9	30.92	26	6.3	25	41.61	30	16.3	6	3.31	27	10.2	28	17.49	30	54.4	8
35.9	31.18		3.8		41.91		16.9		3.58		7.4		17.79		55.2	
Sec δ, Tan δ	1.040		+0.286		1.111		−0.485		1.123		+0.512		1.081		−0.412	
Mean Place	$28^{s}.797$		$29''.86$		$38^{s}.770$		$2''.48$		$1^{s}.562$		$34''.51$		$14^{s}.704$		$39''.96$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		+0.01		+0.01		−0.02		−0.01		+0.02		+0.01		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		−0.8		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Draconis.** Mag. 4.1				**β Scorpii.** Mag. 2.9				**κ Herculis.** Mag. 5.3				**φ Herculis.** Mag. 4.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 16 0		° ′ +58 47		h m 16 0		° ′ −19 34		h m 16 4		° ′ +17 16		h m 16 6		° ′ +45 9	
	s		″		s		″		s		″		s		″	
Jan. 0.9	15.14		20.8		25.04		20.1		10.70		17.3		2.49		17.6	
10.9	15.50	36	17.7	31	25.35	31	21.1	10	10.97	27	14.9	24	2.79	30	14.5	31
20.8	15.91	41	15.0	27	25.68	33	22.2	11	11.27	30	12.6	23	3.13	34	11.8	27
30.8	16.37	46	12.8	22	26.02	34	23.3	11	11.58	31	10.6	20	3.50	37	9.5	23
Feb. 9.8	16.85	48	11.3	15	26.36	34	24.5	12	11.90	32	9.0	16	3.88	38	7.8	17
19.8	17.34	49	10.4	9	26.70	34	25.6	11	12.22	32	7.7	13	4.27	39	6.7	11
Mar. 1.7	17.83	49	10.1	3	27.03	33	26.7	11	12.53	31	7.0	7	4.65	38	6.2	5
11.7	18.29	46	10.6	5	27.35	32	27.6	9	12.83	30	6.7	3	5.01	36	6.4	2
21.7	18.72	43	11.6	10	27.65	30	28.5	9	13.12	29	6.8	1	5.36	35	7.2	8
31.6	19.11	39	13.3	17	27.93	28	29.2	7	13.38	26	7.3	5	5.68	32	8.5	13
Apr. 10.6	19.45	34	15.4	21	28.19	26	29.8	6	13.62	24	8.3	10	5.96	28	10.3	18
20.6	19.73	28	18.0	26	28.42	23	30.2	4	13.83	21	9.6	13	6.20	24	12.6	23
30.6	19.95	22	20.9	29	28.63	21	30.6	4	14.01	18	11.1	15	6.39	19	15.2	26
May 10.5	20.10	15	24.0	31	28.81	18	30.9	3	14.16	15	12.9	18	6.55	16	18.0	28
20.5	20.18	8	27.2	32	28.96	15	31.1	2	14.28	12	14.7	18	6.65	10	20.9	29
30.5	20.20	2	30.3	31	29.07	11	31.2	1	14.37	9	16.7	20	6.71	6	23.8	29
June 9.5	20.15	5	33.4	31	29.15	8	31.2	0	14.43	6	18.6	19	6.72	1	26.7	29
19.4	20.03	12	36.2	28	29.20	5	31.2	0	14.45	2	20.4	18	6.68	4	29.4	27
29.4	19.86	17	38.8	26	29.21	1	31.2	0	14.44	1	22.1	17	6.60	8	31.9	25
July 9.4	19.63	23	41.1	23	29.19	2	31.1	1	14.39	5	23.7	16	6.48	12	34.1	22
19.3	19.35	28	42.9	18	29.14	5	31.0	1	14.32	7	25.0	13	6.31	17	35.9	18
29.3	19.03	32	44.3	14	29.05	9	30.9	1	14.21	11	26.1	11	6.11	20	37.4	15
Aug. 8.3	18.67	36	45.2	9	28.93	12	30.6	3	14.08	13	27.0	9	5.88	23	38.4	10
18.3	18.28	39	45.6	4	28.80	13	30.4	2	13.93	15	27.6	6	5.63	25	39.0	6
28.2	17.89	39	45.5	1	28.65	15	30.1	3	13.76	17	27.8	2	5.37	26	39.1	1
Sept. 7.2	17.49	40	44.9	6	28.49	16	29.7	4	13.59	17	27.8	0	5.10	27	38.7	4
17.2	17.10	39	43.8	11	28.34	15	29.3	4	13.43	16	27.5	3	4.83	27	37.9	8
27.2	16.73	37	42.2	16	28.20	14	28.9	4	13.27	16	26.8	7	4.58	25	36.6	13
Oct. 7.1	16.39	34	40.1	21	28.08	12	28.5	4	13.13	14	25.8	10	4.35	23	34.8	18
17.1	16.10	29	37.5	26	28.00	8	28.2	3	13.02	11	24.6	12	4.16	19	32.6	22
27.1	15.87	23	34.6	29	27.95	5	28.0	2	12.95	7	23.0	16	4.01	15	30.0	26
Nov. 6.0	15.71	16	31.4	32	27.96	1	27.8	2	12.92	3	21.2	18	3.92	9	27.1	29
16.0	15.63	8	27.9	35	28.01	5	27.8	0	12.95	3	19.1	21	3.88	4	24.0	31
26.0	15.63	0	24.2	37	28.11	10	28.0	2	13.02	7	16.8	23	3.91	3	20.6	34
Dec. 6.0	15.71	8	20.5	37	28.27	16	28.4	4	13.14	12	14.3	25	4.01	10	17.1	35
15.9	15.88	17	16.8	37	28.48	21	28.9	5	13.31	17	11.7	26	4.16	15	13.5	36
25.9	16.13	25	13.2	36	28.73	25	29.7	8	13.53	22	9.1	26	4.38	22	10.1	34
35.9	16.45	32	9.9	33	29.02	29	30.6	9	13.78	25	6.6	25	4.65	27	6.8	33
Sec δ, Tan δ	1.930		+1.651		1.061		−0.356		1.047		+0.311		1.418		+1.005	
Mean Place	$16^{s}.612$		$40''.77$		$25^{s}.989$		$14''.97$		$11^{s}.522$		$30''.61$		$3^{s}.595$		$35''.68$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.04		+0.06		+0.01		−0.01		−0.01		+0.01		−0.02		+0.03	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**Groombridge 2320.** Mag. 5.4				**δ¹ Apodis.** Mag. 4.8				**δ Ophiuchi.** Mag. 3.0				**σ Cor. Bor.** *seq.* Mag. 5.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 16 6		° ′ +68 1		h m 16 7		° ′ −78 28		h m 16 9		° ′ − 3 28		h m 16 11		° ′ +34 4	
	s		″		s		″		s		″		s		″	
Jan. 0.9	2.82		51.2		21.15		48.2		49.37		33.9		26.48		17.8	
10.9	3.26	44	48.0	32	22.27	112	46.6	16	49.65	28	35.6	17	26.76	28	14.8	30
20.8	3.77	51	45.3	27	23.50	123	45.4	12	49.95	30	37.2	16	27.07	31	12.2	26
30.8	4.35	58	43.2	21	24.82	132	44.7	7	50.26	31	38.8	16	27.40	33	10.0	22
Feb. 9.8	4.97	62	41.6	16	26.19	137	44.6	1	50.58	32	40.2	14	27.74	34	8.2	18
19.8	5.61	64	40.7	9	27.57	138	45.0	4	50.90	32	41.3	11	28.08	34	7.0	12
Mar. 1.7	6.25	64	40.5	2	28.94	137	45.8	8	51.21	31	42.2	9	28.42	34	6.4	6
11.7	6.87	62	41.0	5	30.27	133	47.0	12	51.51	30	42.9	7	28.75	33	6.3	1
21.7	7.44	57	42.1	11	31.54	127	48.7	17	51.80	29	43.3	4	29.06	31	6.8	5
31.6	7.96	52	43.8	17	32.72	118	50.7	20	52.06	26	43.5	2	29.35	29	7.8	10
Apr. 10.6	8.41	45	46.1	23	33.80	108	53.0	23	52.31	25	43.3	2	29.61	26	9.3	15
20.6	8.78	37	48.7	26	34.75	95	55.7	27	52.53	22	43.0	3	29.83	22	11.3	20
30.6	9.05	27	51.7	30	35.57	82	58.5	28	52.73	20	42.4	6	30.03	20	13.5	22
May 10.5	9.23	18	54.8	31	36.23	66	61.4	29	52.90	17	41.8	6	30.18	15	15.9	24
20.5	9.32	9	58.1	33	36.73	50	64.5	31	53.04	14	41.0	8	30.30	12	18.5	26
30.5	9.30	2	61.3	32	37.07	34	67.6	31	53.15	11	40.1	9	30.38	8	21.1	26
June 9.5	9.20	10	64.4	31	37.22	15	70.6	30	53.23	8	39.2	9	30.42	4	23.7	26
19.4	9.00	20	67.3	29	37.20	2	73.5	29	53.28	5	38.4	8	30.42	0	26.2	25
29.4	8.71	29	70.0	27	37.00	20	76.2	27	53.29	1	37.6	8	30.37	5	28.5	23
July 9.4	8.35	36	72.2	22	36.63	37	78.6	24	53.27	2	36.8	8	30.29	8	30.5	20
19.3	7.92	43	74.1	19	36.11	52	80.7	21	53.22	5	36.0	8	30.18	11	32.3	18
29.3	7.43	49	75.5	14	35.45	66	82.4	17	53.14	8	35.4	6	30.04	14	33.7	14
Aug. 8.3	6.90	53	76.4	9	34.67	78	83.6	12	53.03	11	34.9	5	29.86	18	34.8	11
18.3	6.33	57	76.8	4	33.81	86	84.3	7	52.90	13	34.4	5	29.67	19	35.4	6
28.2	5.75	58	76.7	1	32.90	91	84.6	3	52.76	14	34.1	3	29.46	21	35.6	2
Sept. 7.2	5.16	59	76.0	7	31.97	93	84.2	4	52.61	15	33.9	2	29.24	22	35.5	1
17.2	4.58	58	74.8	12	31.06	91	83.3	9	52.45	16	33.8	1	29.03	21	34.9	6
27.2	4.03	55	73.2	16	30.22	84	81.9	14	52.31	14	33.9	1	28.82	21	33.9	10
Oct. 7.1	3.53	50	71.0	22	29.48	74	80.1	18	52.19	12	34.1	2	28.64	18	32.4	15
17.1	3.08	45	68.4	26	28.89	59	77.8	23	52.10	9	34.5	4	28.49	15	30.6	18
27.1	2.71	37	65.5	29	28.48	41	75.2	26	52.05	5	35.1	6	28.37	12	28.4	22
Nov. 6.0	2.44	27	62.2	33	28.26	22	72.4	28	52.03	2	35.8	7	28.31	6	25.9	25
16.0	2.26	18	58.6	36	28.26	0	69.5	29	52.07	4	36.8	10	28.29	2	23.1	28
26.0	2.19	7	54.9	37	28.49	23	66.6	29	52.15	8	37.9	11	28.34	5	20.1	30
Dec. 6.0	2.24	5	51.1	38	28.95	46	63.8	28	52.28	13	39.2	13	28.43	9	16.9	32
15.9	2.41	17	47.4	37	29.61	66	61.2	26	52.47	19	40.7	15	28.59	16	13.7	32
25.9	2.68	27	43.8	36	30.47	86	58.9	23	52.69	22	42.3	16	28.79	20	10.5	32
35.9	3.06	38	40.4	34	31.50	103	57.0	19	52.95	26	43.9	16	29.04	25	7.4	31
Sec δ, Tan δ	2.673		+2.479		5.009		−4.908		1.002		−0.061		1.207		+0.676	
Mean Place	5ˢ.013		71″.51		27ˢ.156		51″.95		50ˢ.232		24″.99		27ˢ.451		34″.02	
D′ψ a, Dω a	−0.06		+0.08		+0.11		−0.16		0.00		0.00		−0.02		+0.02	
Dψ δ, Dω δ	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	19 Ursæ Minoris. Mag. 5.5				γ^2 Normæ. Mag. 4.1				ε Ophiuchi. Mag. 3.3				σ Scorpii. Mag. 3.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 16 13		° ′ +76 5		h m 16 13		° ′ −49 56		h m 16 13		° ′ − 4 29		h m 16 15		° ′ −25 23	
	s		″		s		″		s		″		s		″	
Jan. 0.9	11.97		19.8		22.12		44.1		45.28		9.8		56.44		18.8	
10.9	12.56	59	16.7	31	22.53	41	43.5	6	45.55	27	11.4	16	56.74	30	19.4	6
20.8	13.27	71	14.0	27	22.97	44	43.3	2	45.85	30	13.0	16	57.08	34	20.2	8
30.8	14.09	82	11.9	21	23.43	46	43.4	1	46.17	32	14.5	15	57.42	34	21.1	9
Feb. 9.8	14.99	90	10.3	16	23.91	48	43.8	4	46.49	32	15.9	14	57.78	36	22.0	9
19.8	15.93	94	9.4	9	24.39	48	44.5	7	46.81	32	17.1	12	58.13	35	23.0	10
Mar. 1.7	16.88	95	9.2	2	24.86	47	45.4	9	47.12	31	18.0	9	58.48	35	23.9	9
11.7	17.80	92	9.7	5	25.31	45	46.5	11	47.42	30	18.6	6	58.82	34	24.8	9
21.7	18.66	86	10.8	11	25.75	44	47.8	13	47.71	29	19.0	4	59.14	32	25.7	9
31.7	19.44	78	12.5	17	26.16	41	49.3	15	47.98	27	19.2	2	59.44	30	26.5	8
Apr. 10.6	20.12	68	14.7	22	26.53	37	50.9	16	48.23	25	19.1	1	59.72	28	27.2	7
20.6	20.66	54	17.4	27	26.88	35	52.6	17	48.45	22	18.8	3	59.98	26	27.8	6
30.6	21.06	40	20.3	29	27.18	30	54.4	18	48.65	20	18.3	5	60.21	23	28.4	6
May 10.5	21.31	25	23.5	32	27.45	27	56.2	18	48.83	18	17.6	7	60.41	20	28.9	5
20.5	21.40	9	26.7	32	27.67	22	58.1	19	48.97	14	16.9	7	60.58	17	29.4	5
30.5	21.34	6	29.9	32	27.84	17	59.9	18	49.09	12	16.1	8	60.72	14	29.8	4
June 9.5	21.13	21	33.0	31	27.96	12	61.6	17	49.17	8	15.2	9	60.82	10	30.2	4
19.4	20.77	36	36.0	30	28.02	6	63.3	17	49.23	6	14.4	8	60.88	6	30.5	3
29.4	20.27	50	38.6	26	28.03	1	64.8	15	49.24	1	13.6	8	60.91	3	30.8	3
July 9.4	19.65	62	40.8	22	27.99	4	66.2	14	49.22	2	12.8	8	60.90	1	31.0	2
19.4	18.93	72	42.7	19	27.89	10	67.4	12	49.18	4	12.1	7	60.85	5	31.2	2
29.3	18.12	81	44.1	14	27.75	14	68.3	9	49.10	8	11.5	6	60.77	8	31.2	0
Aug. 8.3	17.23	89	45.0	9	27.57	18	68.9	6	48.99	11	11.0	5	60.65	12	31.2	0
18.3	16.30	93	45.4	4	27.35	22	69.2	3	48.87	12	10.6	4	60.51	14	31.1	1
28.2	15.34	96	45.3	1	27.12	23	69.1	1	48.72	15	10.2	4	60.36	15	30.9	2
Sept. 7.2	14.37	97	44.7	6	26.87	25	68.8	3	48.57	15	10.0	2	60.19	17	30.5	4
17.2	13.42	95	43.6	11	26.62	25	68.1	7	48.42	15	9.9	1	60.03	16	30.1	4
27.2	12.51	91	41.9	17	26.40	22	67.1	10	48.28	14	9.9	0	59.88	15	29.6	5
Oct. 7.1	11.66	85	39.8	21	26.20	20	65.8	13	48.15	13	10.1	2	59.74	14	29.1	5
17.1	10.90	76	37.3	25	26.05	15	64.3	15	48.06	9	10.4	3	59.64	10	28.5	6
27.1	10.25	65	34.4	29	25.95	10	62.6	17	48.00	6	10.9	5	59.58	6	28.0	5
Nov. 6.1	9.74	51	31.1	33	25.92	3	60.9	17	47.98	2	11.6	7	59.57	1	27.5	5
16.0	9.38	36	27.6	35	25.97	5	59.2	17	48.02	4	12.5	9	59.61	4	27.2	3
26.0	9.18	20	24.0	36	26.09	12	57.5	17	48.10	8	13.6	11	59.70	9	26.9	3
Dec. 6.0	9.15	3	20.2	38	26.28	19	56.0	15	48.23	13	14.8	12	59.85	15	26.9	0
15.9	9.30	15	16.5	37	26.54	26	54.7	13	48.41	18	16.2	14	60.05	20	27.0	1
25.9	9.63	33	12.9	36	26.87	33	53.6	11	48.63	22	17.7	15	60.30	25	27.3	3
35.9	10.11	48	9.6	33	27.25	38	52.9	7	48.89	26	19.3	16	60.59	29	27.8	5
Sec δ, Tan δ	4.160		+4.038		1.554		−1.190		1.003		−0.078		1.107		−0.474	
Mean Place	$15^{s}.660$		40″.08		$23^{s}.777$		44″.13		$46^{s}.155$		1″.08		$57^{s}.496$		14″.36	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.10		+0.12		+0.03		−0.04		0.00		0.00		+0.01		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Herculis. Mag. 3.9				γ Herculis. Mag. 3.8				η Ursæ Minoris. Mag. 5.0				γ Apodis. Mag. 3.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 17		+46 30		16 18		+19 20		16 19		+75 56		16 20		−78 42	
	s		″		s		″		s		″		s		″	
Jan. 0.9	8.13		45.6		6.65		62.1		56.30		54.4		7.11		19.1	
10.9	8.42	29	42.5	31	6.91	26	59.5	26	56.86	56	51.2	32	8.21	110	17.3	18
20.8	8.75	33	39.7	28	7.20	29	57.2	23	57.55	69	48.4	28	9.44	123	16.0	13
30.8	9.11	36	37.3	24	7.51	31	55.2	20	58.34	79	46.2	22	10.76	132	15.2	8
Feb. 9.8	9.50	39	35.5	18	7.82	31	53.5	17	59.22	88	44.6	16	12.13	137	14.8	4
19.8	9.89	39	34.3	12	8.14	32	52.2	13	60.14	92	43.7	9	13.54	141	14.9	1
Mar. 1.7	10.28	39	33.8	5	8.46	32	51.4	8	61.08	94	43.4	3	14.95	141	15.5	6
11.7	10.66	38	33.8	0	8.76	30	51.1	3	62.00	92	43.8	4	16.33	138	16.6	11
21.7	11.01	35	34.5	7	9.05	29	51.2	1	62.87	87	44.8	10	17.65	132	18.1	15
31.7	11.34	33	35.8	13	9.32	27	51.8	6	63.66	79	46.4	16	18.89	124	19.9	18
Apr. 10.6	11.64	30	37.6	18	9.57	25	52.8	10	64.34	68	48.6	22	20.03	114	22.1	22
20.6	11.89	25	39.8	22	9.79	22	54.2	14	64.90	56	51.2	26	21.05	102	24.5	24
30.6	12.11	22	42.4	26	9.99	20	55.9	17	65.32	42	54.1	29	21.93	88	27.2	27
May 10.5	12.28	17	45.2	28	10.16	17	57.7	18	65.59	27	57.2	31	22.67	74	30.1	29
20.5	12.39	11	48.2	30	10.29	13	59.7	20	65.70	11	60.5	33	23.24	57	33.1	30
30.5	12.46	7	51.2	30	10.39	10	61.8	21	65.67	3	63.7	32	23.64	40	36.1	30
June 9.5	12.48	2	54.2	30	10.45	6	63.8	20	65.48	19	66.9	32	23.86	22	39.1	30
19.4	12.45	3	57.0	28	10.48	3	65.8	20	65.14	34	69.9	30	23.90	4	42.0	29
29.4	12.38	7	59.6	26	10.48	0	67.7	19	64.68	46	72.6	27	23.75	15	44.8	28
July 9.4	12.26	12	61.9	23	10.44	4	69.4	17	64.09	59	74.9	23	23.42	33	47.3	25
19.4	12.09	17	63.8	19	10.37	7	70.9	15	63.38	71	76.8	19	22.93	49	49.5	22
29.3	11.89	20	65.4	16	10.26	11	72.1	12	62.59	79	78.4	16	22.29	64	51.3	18
Aug. 8.3	11.66	23	66.6	12	10.13	13	73.0	9	61.72	87	79.4	10	21.53	76	52.6	13
18.3	11.40	26	67.3	7	9.98	15	73.7	7	60.80	92	79.9	5	20.66	87	53.5	9
28.2	11.12	28	67.5	2	9.81	17	74.1	4	59.84	96	79.9	0	19.73	93	53.9	4
Sept. 7.2	10.84	28	67.3	2	9.64	17	74.1	0	58.87	97	79.4	5	18.78	95	53.8	1
17.2	10.56	28	66.5	8	9.46	18	73.8	3	57.92	95	78.4	10	17.84	94	53.1	7
27.2	10.29	27	65.3	12	9.29	17	73.2	6	57.01	91	76.9	15	16.96	88	51.8	13
Oct. 7.1	10.04	25	63.7	16	9.15	14	72.3	9	56.15	86	74.9	20	16.17	79	50.1	17
17.1	9.83	21	61.6	21	9.03	12	71.0	13	55.38	77	72.4	25	15.52	65	48.0	21
27.1	9.67	16	59.0	26	8.94	9	69.4	16	54.72	66	69.6	28	15.04	48	45.5	25
Nov. 6.1	9.55	12	56.2	28	8.89	5	67.5	19	54.19	53	66.4	32	14.76	28	42.7	28
16.0	9.50	5	53.0	32	8.90	1	65.4	21	53.80	39	63.0	34	14.70	6	39.8	29
26.0	9.51	1	49.6	34	8.96	6	63.0	24	53.58	22	59.4	36	14.87	17	36.9	29
Dec. 6.0	9.59	8	46.1	35	9.06	10	60.5	25	53.52	6	55.6	38	15.27	40	34.0	29
15.9	9.73	14	42.6	35	9.22	16	57.9	26	53.64	12	51.9	37	15.89	62	31.3	27
25.9	9.93	20	39.1	35	9.42	20	55.2	27	53.94	30	48.3	36	16.71	82	28.9	24
35.9	10.19	26	35.8	33	9.66	24	52.6	26	54.40	46	45.0	33	17.71	100	26.9	20
Sec δ, Tan δ	1.453		+1.054		1.060		+0.351		4.119		+3.996		5.108		−5.009	
Mean Place	$9^{s}.346$		$63''.44$		$7^{s}.540$		$75''.61$		$60^{s}.111$		$74''.21$		$13^{s}.312$		$21''.88$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.03		+0.03		−0.01		+0.01		−0.10		+0.11		+0.12		−0.14	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ω Herculis. Mag. 4.5				η Draconis. Mag. 2.9				α Scorpii. Mag. 1.2				β Herculis. Mag. 2.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 16 21 s		° ′ +14 13 ″		h m 16 22 s		° ′ +61 42 ″		h m 16 24 s		° ′ −26 14 ″		h m 16 26 s		° ′ +21 40 ″	
Jan. 0.9	25.67	26	37.5	24	47.57	35	12.0	33	6.81	30	35.9	6	30.36	25	20.6	26
10.9	25.93	29	35.1	22	47.92	41	8.7	28	7.11	33	36.5	6	30.61	29	18.0	24
20.9	26.22	30	32.9	19	48.33	46	5.9	24	7.44	35	37.1	8	30.90	30	15.6	21
30.8	26.52	32	31.0	17	48.79	50	3.5	18	7.79	35	37.9	8	31.20	32	13.5	18
Feb. 9.8	26.84	31	29.3	12	49.29	52	1.7	12	8.14	36	38.7	9	31.52	32	11.7	13
19.8	27.15	31	28.1	9	49.81	52	0.5	5	8.50	35	39.6	9	31.84	32	10.4	8
Mar. 1.7	27.46	30	27.2	4	50.33	51	0.0	3	8.85	34	40.5	8	32.16	31	9.6	3
11.7	27.76	29	26.8	0	50.84	49	0.3	8	9.19	33	41.3	8	32.47	29	9.3	2
21.7	28.05	27	26.8	5	51.33	44	1.1	15	9.52	31	42.1	8	32.76	28	9.5	6
31.7	28.32	25	27.3	8	51.77	39	2.6	20	9.83	28	42.9	7	33.04	25	10.1	11
Apr. 10.6	28.57	22	28.1	12	52.16	34	4.6	25	10.11	27	43.6	6	33.29	23	11.2	14
20.6	28.79	20	29.3	14	52.50	27	7.1	28	10.38	24	44.2	6	33.52	21	12.6	17
30.6	28.99	17	30.7	16	52.77	19	9.9	31	10.62	21	44.8	5	33.73	17	14.3	20
May 10.5	29.16	14	32.3	18	52.96	13	13.0	32	10.83	18	45.3	5	33.90	14	16.3	21
20.5	29.30	11	34.1	18	53.09	5	16.2	33	11.01	15	45.8	4	34.04	10	18.4	22
30.5	29.41	7	35.9	18	53.14	3	19.5	31	11.16	11	46.2	4	34.14	8	20.6	22
June 9.5	29.48	4	37.7	18	53.11	10	22.6	31	11.27	7	46.6	4	34.22	3	22.8	21
19.4	29.52	1	39.5	17	53.01	17	25.7	28	11.34	3	47.0	3	34.25	0	24.9	20
29.4	29.53	3	41.2	15	52.84	24	28.5	24	11.37	0	47.3	3	34.25	4	26.9	18
July 9.4	29.50	6	42.7	14	52.60	30	30.9	21	11.37	4	47.6	2	34.21	7	28.7	16
19.4	29.44	10	44.1	11	52.30	34	33.0	16	11.33	8	47.8	1	34.14	11	30.3	14
29.3	29.34	12	45.2	9	51.96	39	34.6	12	11.25	11	47.9	0	34.03	13	31.7	10
Aug. 8.3	29.22	14	46.1	6	51.57	42	35.8	7	11.14	14	47.9	1	33.90	15	32.7	7
18.3	29.08	16	46.7	4	51.15	45	36.5	2	11.00	16	47.8	2	33.75	18	33.4	5
28.2	28.92	17	47.1	1	50.70	45	36.7	3	10.84	16	47.6	2	33.57	18	33.9	1
Sept. 7.2	28.75	17	47.2	1	50.25	45	36.4	9	10.68	17	47.4	4	33.39	18	34.0	3
17.2	28.58	16	47.1	5	49.80	44	35.5	13	10.51	16	47.0	5	33.21	18	33.7	6
27.2	28.42	14	46.6	8	49.36	40	34.2	18	10.35	14	46.5	5	33.03	16	33.1	10
Oct. 7.1	28.28	12	45.8	11	48.96	36	32.4	23	10.21	11	46.0	6	32.87	13	32.1	13
17.1	28.16	8	44.7	13	48.60	30	30.1	28	10.10	7	45.4	5	32.74	10	30.8	16
27.1	28.08	4	43.4	16	48.30	23	27.3	31	10.03	2	44.9	6	32.64	5	29.2	20
Nov. 6.1	28.04	1	41.8	19	48.07	14	24.2	34	10.01	4	44.3	4	32.59	1	27.2	22
16.0	28.05	6	39.9	21	47.93	6	20.8	36	10.05	9	43.9	3	32.58	5	25.0	24
26.0	28.11	11	37.8	23	47.87	3	17.2	37	10.14	14	43.6	1	32.63	9	22.6	26
Dec. 6.0	28.22	15	35.5	24	47.90	12	13.5	38	10.28	19	43.5	0	32.72	14	20.0	28
15.9	28.37	20	33.1	24	48.02	21	9.7	36	10.47	24	43.5	3	32.86	20	17.2	27
25.9	28.57	24	30.7	24	48.23	30	6.1	35	10.71	28	43.8	3	33.06	23	14.5	27
35.9	28.81		28.3		48.53		2.6		10.99		44.1		33.29		11.8	
Sec δ, Tan δ	1.032		+0.253		2.110		+1.858		1.115		−0.493		1.076		+0.397	
Mean Place	26ˢ.560		50″.02		49ˢ.466		31″.02		7ˢ.900		31″.27		31ˢ.299		34″.41	
D′ψ a, Dω a	−0.01		+0.01		−0.04		+0.05		+0.01		−0.01		−0.01		+0.01	
Dψ δ, Dω δ	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

Mean Solar Date.	λ Ophiuchi. Mag. 3.8				A Draconis. Mag. 5.0				τ Scorpii. Mag. 2.9				σ Herculis. Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 26		+ 2 9		16 28		+68 56		16 30		−28 2		16 31		+42 36	
	s		″		s		″		s		″		s		″	
Jan. 0.9	33.58		66.8		6.08		56.1		30.42		23.3		18.59		32.7	
10.9	33.84	26	64.9	19	6.47	39	52.8	33	30.72	30	23.6	3	18.86	27	29.5	32
20.9	34.13	29	63.1	18	6.96	49	49.9	29	31.05	33	24.2	6	19.16	30	26.7	28
30.8	34.43	30	61.5	16	7.52	56	47.5	24	31.40	35	24.8	6	19.50	34	24.3	24
Feb. 9.8	34.74	31	60.0	15	8.14	62	45.8	17	31.76	36	25.6	8	19.86	36	22.4	19
19.8	35.06	32	58.8	12	8.79	65	44.6	12	32.12	36	26.4	8	20.23	37	21.0	14
Mar. 1.7	35.37	31	57.9	9	9.45	66	44.1	5	32.48	36	27.2	8	20.60	37	20.3	7
11.7	35.67	30	57.4	5	10.10	65	44.4	3	32.83	35	28.0	8	20.96	36	20.2	1
21.7	35.96	29	57.1	3	10.72	62	45.2	8	33.16	33	28.8	8	21.31	35	20.7	5
31.7	36.23	27	57.2	1	11.29	57	46.7	15	33.48	32	29.6	8	21.63	32	21.8	11
Apr. 10.6	36.48	25	57.6	4	11.79	50	48.8	21	33.77	29	30.3	7	21.92	29	23.4	16
20.6	36.71	23	58.3	7	12.21	42	51.3	25	34.05	28	30.9	6	22.18	26	25.5	21
30.6	36.92	21	59.1	8	12.55	34	54.1	28	34.30	25	31.5	6	22.41	23	28.0	25
May 10.6	37.10	18	60.2	11	12.79	24	57.2	31	34.52	22	32.1	6	22.59	18	30.7	27
20.5	37.25	15	61.3	11	12.92	13	60.5	33	34.71	19	32.7	6	22.73	14	33.5	28
30.5	37.37	12	62.5	12	12.96	4	63.8	33	34.86	15	33.2	5	22.82	9	36.5	30
June 9.5	37.47	10	63.8	13	12.89	7	67.0	32	34.98	12	33.7	5	22.87	5	39.4	29
19.4	37.52	5	65.0	12	12.73	16	70.0	30	35.06	8	34.2	5	22.87	0	42.2	28
29.4	37.54	2	66.1	11	12.47	26	72.9	29	35.10	4	34.6	4	22.82	5	44.8	26
July 9.4	37.53	1	67.2	11	12.12	35	75.4	25	35.11	1	34.9	3	22.73	9	47.2	24
19.4	37.49	4	68.2	10	11.70	42	77.5	21	35.07	4	35.2	3	22.59	14	49.3	21
29.3	37.41	8	69.0	8	11.21	49	79.2	17	34.99	8	35.4	2	22.42	17	51.0	17
Aug. 8.3	37.30	11	69.7	7	10.66	55	80.4	12	34.88	11	35.5	1	22.22	20	52.3	13
18.3	37.17	13	70.2	5	10.07	59	81.1	7	34.74	14	35.5	0	21.99	23	53.1	8
28.3	37.03	14	70.6	4	9.46	61	81.3	2	34.58	16	35.4	1	21.74	25	53.6	5
Sept. 7.2	36.87	16	70.8	2	8.83	63	81.0	3	34.41	17	35.1	3	21.47	27	53.5	1
17.2	36.72	15	70.8	0	8.20	63	80.2	8	34.24	17	34.7	4	21.21	26	53.0	5
27.2	36.57	15	70.7	1	7.60	60	78.8	14	34.07	17	34.2	5	20.96	25	52.0	10
Oct. 7.1	36.43	14	70.3	4	7.03	57	77.0	18	33.93	14	33.7	5	20.73	23	50.6	14
17.1	36.33	10	69.7	6	6.52	51	74.7	23	33.82	11	33.1	6	20.52	21	48.8	18
27.1	36.25	8	68.9	8	6.09	43	71.9	28	33.74	8	32.4	7	20.36	16	46.5	23
Nov. 6.1	36.22	3	67.9	10	5.74	35	68.8	31	33.71	3	31.8	6	20.24	12	43.8	27
16.0	36.24	2	66.6	13	5.49	25	65.4	34	33.74	3	31.3	5	20.18	6	40.9	29
26.0	36.30	6	65.2	14	5.36	13	61.8	36	33.82	8	30.9	4	20.19	1	37.7	32
Dec. 6.0	36.41	11	63.6	16	5.34	2	58.1	37	33.96	14	30.6	3	20.25	6	34.3	34
16.0	36.57	16	61.9	17	5.44	10	54.3	38	34.15	19	30.5	1	20.37	12	30.8	35
25.9	36.78	21	60.1	18	5.66	22	50.7	36	34.39	24	30.6	1	20.55	18	27.4	34
35.9	37.02	24	58.2	19	6.00	34	47.2	35	34.67	28	30.9	3	20.79	24	24.2	32
Sec δ, Tan δ	1.001		+0.038		2.784		+2.598		1.133		−0.532		1.359		+0.920	
Mean Place	34^s.482		77″.00		8^s.713		75″.20		31^s.553		18″.68		19^s.815		49″.41	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		0.00		−0.06		+0.07		+0.01		−0.01		−0.02		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ophiuchi. Mag. 2.7				24 Scorpii. Mag. 5.0				ζ Herculis. Mag. 3.0				α Triang. Aust. Mag. 1.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 16 32 s		° ′ −10 23 ″		h m 16 36 s		° ′ −17 34 ″		h m 16 38 s		° ′ +31 45 ″		h m 16 39 s		° ′ −68 52 ″	
Jan. 0.9	24.33	27	45.2	13	34.79	28	42.1	9	1.55	25	13.7	29	29.49	61	16.2	16
10.9	24.60	29	46.5	13	35.07	30	43.0	9	1.80	28	10.8	27	30.10	69	14.6	13
20.9	24.89	31	47.8	12	35.37	32	43.9	10	2.08	31	8.1	23	30.79	74	13.3	9
30.8	25.20	32	49.0	12	35.69	33	44.9	10	2.39	32	5.8	19	31.53	78	12.4	5
Feb. 9.8	25.52	33	50.2	10	36.02	34	45.9	9	2.71	33	3.9	13	32.31	79	11.9	0
19.8	25.85	32	51.2	9	36.36	33	46.8	8	3.04	34	2.6	9	33.10	80	11.9	4
Mar. 1.8	26.17	31	52.1	6	36.69	32	47.6	7	3.38	33	1.7	2	33.90	80	12.3	8
11.7	26.48	30	52.7	5	37.01	31	48.3	6	3.71	31	1.5	3	34.70	77	13.1	11
21.7	26.78	28	53.2	3	37.32	30	48.9	4	4.02	30	1.8	8	35.47	72	14.2	15
31.7	27.06	27	53.5	1	37.62	28	49.3	3	4.32	27	2.6	14	36.19	68	15.7	17
Apr. 10.6	27.33	25	53.6	2	37.90	26	49.6	2	4.59	25	4.0	17	36.87	62	17.4	20
20.6	27.58	22	53.4	2	38.16	23	49.8	0	4.84	22	5.7	21	37.49	56	19.4	23
30.6	27.80	19	53.2	4	38.39	21	49.8	0	5.06	18	7.8	24	38.05	49	21.7	24
May 10.6	27.99	17	52.8	5	38.60	18	49.8	0	5.24	14	10.2	25	38.54	40	24.1	25
20.5	28.16	14	52.3	5	38.78	15	49.8	1	5.38	11	12.7	27	38.94	31	26.6	26
30.5	28.30	11	51.8	6	38.93	12	49.7	2	5.49	7	15.4	26	39.25	22	29.2	26
June 9.5	28.41	7	51.2	5	39.05	8	49.5	2	5.56	3	18.0	26	39.47	12	31.8	25
19.5	28.48	3	50.7	6	39.13	4	49.3	1	5.59	1	20.6	24	39.59	1	34.3	24
29.4	28.51	0	50.1	5	39.17	1	49.2	2	5.58	5	23.0	22	39.60	9	36.7	23
July 9.4	28.51	3	49.6	5	39.18	3	49.0	2	5.53	9	25.2	19	39.51	18	39.0	20
19.4	28.48	7	49.1	4	39.15	7	48.8	2	5.44	13	27.1	16	39.33	27	41.0	17
29.3	28.41	10	48.7	4	39.08	10	48.6	1	5.31	15	28.7	13	39.06	35	42.7	13
Aug. 8.3	28.31	12	48.3	4	38.98	12	48.5	2	5.16	18	30.0	9	38.71	42	44.0	10
18.3	28.19	14	47.9	3	38.86	15	48.3	3	4.98	21	30.9	5	38.29	46	45.0	5
28.3	28.05	15	47.6	2	38.71	16	48.0	2	4.77	21	31.4	2	37.83	48	45.5	0
Sept. 7.2	27.90	16	47.4	2	38.55	16	47.8	3	4.56	21	31.6	3	37.35	50	45.5	5
17.2	27.74	15	47.2	1	38.39	15	47.5	2	4.35	21	31.3	7	36.85	47	45.0	10
27.2	27.59	13	47.1	1	38.24	14	47.3	3	4.14	20	30.6	12	36.38	42	44.0	14
Oct. 7.1	27.46	11	47.0	1	38.10	11	47.0	2	3.94	16	29.4	15	35.96	36	42.6	18
17.1	27.35	7	47.1	2	37.99	7	46.8	1	3.78	13	27.9	19	35.60	27	40.8	21
27.1	27.28	3	47.3	4	37.92	3	46.7	0	3.65	9	26.0	22	35.33	16	38.7	24
Nov. 6.1	27.25	2	47.7	5	37.89	1	46.7	0	3.56	4	23.8	26	35.17	4	36.3	25
16.0	27.27	7	48.2	6	37.90	7	46.7	2	3.52	1	21.2	28	35.13	8	33.8	26
26.0	27.34	11	48.8	9	37.97	12	46.9	4	3.53	7	18.4	30	35.21	21	31.2	25
Dec. 6.0	27.45	17	49.7	9	38.09	17	47.3	5	3.60	13	15.4	30	35.42	34	28.7	24
16.0	27.62	21	50.6	11	38.26	22	47.8	7	3.73	18	12.4	32	35.76	45	26.3	22
25.9	27.83	25	51.7	12	38.48	25	48.5	8	3.91	22	9.2	30	36.21	55	24.1	19
35.9	28.08		52.9		38.73		49.3		4.13		6.2		36.76		22.2	
Sec δ, Tan δ	1.017		−0.183		1.049		−0.317		1.176		+0.619		2.775		−2.588	
Mean Place	25ˢ.292		37″.33		35ˢ.819		35″.41		2ˢ.634		28″.75		32ˢ.784		16″.68	
D′ψ α, Dω α	0.00		0.00		+0.01		−0.01		−0.02		+0.01		+0.06		−0.06	
Dψ δ, Dω δ	−0.1		−0.9		−0.1		−0.9		−0.1		−0.9		−0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**η Herculis.** Mag. 3.6				**Groombridge 2377.** Mag. 4.9				**ε Scorpii.** Mag. 2.4				**49 Herculis.** Mag. 6.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° '		h m		° '		h m		° '		h m		° '	
	16 39		+39 4		16 43		+56 55		16 44		−34 8		16 48		+15 6	
	s		"		s		"		s		"		s		"	
Jan. 0.9	55.61		50.7		38.11		49.5		34.12		21.7		8.90		51.3	
10.9	55.86	25	47.6	31	38.40	29	46.2	33	34.43	31	21.7	0	9.14	24	48.9	24
20.9	56.15	29	44.8	28	38.75	35	43.2	30	34.77	34	21.8	1	9.40	26	46.7	22
30.8	56.47	32	42.3	25	39.14	39	40.6	26	35.13	36	22.1	3	9.69	29	44.7	20
Feb. 9.8	56.81	34	40.3	20	39.58	44	38.5	21	35.50	37	22.6	5	10.00	31	43.0	17
19.8	57.17	36	38.9	14	40.03	45	37.1	14	35.88	38	23.2	6	10.31	31	41.7	13
Mar. 1.8	57.52	35	38.1	8	40.49	46	36.4	7	36.26	38	23.8	6	10.62	31	40.8	9
11.7	57.87	35	37.9	2	40.95	46	36.3	1	36.63	37	24.5	7	10.92	30	40.4	4
21.7	58.21	34	38.3	4	41.39	44	36.9	6	36.99	36	25.2	7	11.22	30	40.4	0
31.7	58.53	32	39.3	10	41.81	42	38.1	12	37.33	34	26.0	8	11.50	28	40.8	4
Apr. 10.6	58.82	29	40.7	14	42.18	37	39.9	18	37.65	32	26.8	8	11.77	27	41.6	8
20.6	59.08	26	42.7	20	42.51	33	42.2	23	37.96	31	27.6	8	12.01	24	42.8	12
30.6	59.31	23	45.0	23	42.79	28	44.8	26	38.23	27	28.5	9	12.23	22	44.2	14
May 10.6	59.50	19	47.6	26	43.01	22	47.8	30	38.48	25	29.3	8	12.42	19	45.9	17
20.5	59.64	14	50.4	28	43.17	16	51.0	32	38.69	21	30.1	8	12.59	17	47.8	19
30.5	59.75	11	53.2	28	43.26	9	54.2	32	38.87	18	31.0	9	12.72	13	49.7	19
June 9.5	59.81	6	56.1	29	43.29	3	57.4	32	39.01	14	31.8	8	12.82	10	51.7	20
19.5	59.83	2	58.8	27	43.25	4	60.5	31	39.11	10	32.6	8	12.88	6	53.6	19
29.4	59.80	3	61.4	26	43.15	10	63.5	30	39.17	6	33.3	7	12.91	3	55.5	19
July 9.4	59.73	7	63.8	24	42.99	16	66.1	26	39.18	1	34.0	7	12.90	1	57.2	17
19.4	59.62	11	65.9	21	42.77	22	68.4	23	39.14	4	34.6	6	12.85	5	58.7	15
29.3	59.47	15	67.6	17	42.51	26	70.4	20	39.07	7	35.1	5	12.77	8	60.0	13
Aug. 8.3	59.29	18	69.0	14	42.20	31	71.8	14	38.96	11	35.4	3	12.66	11	61.1	11
18.3	59.08	21	70.0	10	41.85	35	72.8	10	38.81	15	35.6	2	12.52	14	61.9	8
28.3	58.85	23	70.5	5	41.48	37	73.4	6	38.64	17	35.7	1	12.37	15	62.4	5
Sept. 7.2	58.61	24	70.6	1	41.09	39	73.4	0	38.46	18	35.5	2	12.20	17	62.6	2
17.2	58.36	25	70.2	4	40.70	39	72.9	5	38.27	19	35.2	3	12.02	18	62.6	0
27.2	58.12	24	69.4	8	40.32	38	71.9	10	38.08	19	34.7	5	11.85	17	62.2	4
Oct. 7.2	57.90	22	68.1	13	39.96	36	70.4	15	37.91	17	34.0	7	11.69	16	61.6	6
17.1	57.70	20	66.4	17	39.64	32	68.4	20	37.78	13	33.2	8	11.56	13	60.6	10
27.1	57.55	15	64.3	21	39.36	28	65.9	25	37.69	9	32.4	8	11.45	11	59.4	12
Nov. 6.1	57.44	11	61.8	25	39.15	21	63.1	28	37.64	5	31.5	9	11.39	6	57.8	16
16.0	57.38	6	59.0	28	39.00	15	60.0	31	37.65	1	30.7	8	11.37	2	56.0	18
26.0	57.38	0	56.0	30	38.93	7	56.5	35	37.71	6	29.9	8	11.40	3	54.0	20
Dec. 6.0	57.44	6	52.7	33	38.93	0	52.9	36	37.84	13	29.2	7	11.48	8	51.8	22
16.0	57.55	11	49.4	33	39.02	9	49.2	37	38.03	19	28.6	6	11.61	13	49.4	24
25.9	57.72	17	46.1	33	39.19	17	45.6	36	38.26	23	28.3	3	11.78	17	47.0	24
35.9	57.95	23	42.8	33	39.44	25	42.1	35	38.54	28	28.1	2	12.00	22	44.6	24
Sec δ, Tan δ	1.288		+0.812		1.833		+1.536		1.208		−0.678		1.036		+0.270	
Mean Place	56ˢ.816		66″.61		39ˢ.934		66″.98		35ˢ.388		17″.51		9ˢ.892		63″.66	
$D'_\psi\alpha$, $D_\omega\alpha$	−0.02		+0.02		−0.04		+0.03		+0.02		−0.01		−0.01		+0.01	
$D_\psi\delta$, $D_\omega\delta$	−0.1		−0.9		−0.1		−0.9		−0.1		−0.9		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε¹ Aræ. Mag. 4.2				κ Ophiuchi. Mag. 3.4				30 Ophiuchi. Mag. 5.0				ε Herculis. Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 52		−53 1		16 53		+ 9 30		16 56		− 4 5		16 56		+31 2	
	s		″		s		″		s		″		s		″	
Jan. 0.9	41.56		48.7		34.81		17.2		30.51		49.3		58.76		54.3	
10.9	41.95	39	47.6	11	35.05	24	15.0	22	30.76	25	50.8	15	58.99	23	51.3	30
20.9	42.38	43	46.8	8	35.31	26	13.0	20	31.03	27	52.2	14	59.25	26	48.6	27
30.8	42.85	47	46.3	5	35.59	28	11.2	18	31.32	29	53.6	14	59.54	29	46.3	23
Feb. 9.8	43.34	49	46.0	3	35.89	30	9.6	16	31.62	30	54.8	12	59.86	32	44.3	20
19.8	43.84	50	46.1	1	36.20	31	8.4	12	31.93	31	55.8	10	60.19	33	42.8	15
Mar. 1.8	44.34	50	46.5	4	36.51	31	7.5	9	32.25	32	56.6	8	60.52	33	41.8	10
11.7	44.84	50	47.1	6	36.81	30	7.0	5	32.55	30	57.2	6	60.85	33	41.4	4
21.7	45.33	49	47.9	8	37.11	30	6.9	1	32.85	30	57.5	3	61.17	32	41.6	2
31.7	45.79	46	49.0	11	37.39	28	7.2	3	33.14	29	57.5	0	61.47	30	42.3	7
Apr. 10.7	46.24	45	50.2	12	37.65	26	7.8	6	33.41	27	57.3	2	61.75	28	43.5	12
20.6	46.65	41	51.6	14	37.90	25	8.8	10	33.67	26	56.8	5	62.02	27	45.2	17
30.6	47.02	37	53.1	15	38.13	23	10.0	12	33.91	24	56.1	7	62.25	23	47.2	20
May 10.6	47.36	34	54.8	17	38.33	20	11.5	15	34.12	21	55.3	8	62.45	20	49.5	23
20.5	47.65	29	56.5	17	38.50	17	13.1	16	34.30	18	54.4	9	62.62	17	52.1	26
30.5	47.89	24	58.3	18	38.64	14	14.8	17	34.46	16	53.5	9	62.75	13	54.7	26
June 9.5	48.07	18	60.2	19	38.74	10	16.5	17	34.58	12	52.5	10	62.84	9	57.4	27
19.5	48.20	13	62.0	18	38.82	8	18.2	17	34.67	9	51.5	10	62.89	5	60.0	26
29.4	48.26	6	63.7	17	38.86	4	19.8	16	34.72	5	50.5	10	62.90	1	62.5	25
July 9.4	48.26	0	65.3	16	38.86	0	21.3	15	34.74	2	49.7	8	62.87	3	64.8	23
19.4	48.20	6	66.8	15	38.82	4	22.6	13	34.72	2	48.9	8	62.80	7	66.8	20
29.4	48.09	11	68.1	13	38.75	7	23.8	12	34.66	6	48.2	7	62.69	11	68.6	18
Aug. 8.3	47.92	17	69.1	10	38.65	10	24.8	10	34.57	9	47.6	6	62.54	15	70.0	14
18.3	47.71	21	69.8	7	38.52	13	25.5	7	34.45	12	47.1	5	62.37	17	71.0	10
28.3	47.46	25	70.2	4	38.37	15	26.0	5	34.32	13	46.8	3	62.17	20	71.7	7
Sept. 7.2	47.19	27	70.2	0	38.21	16	26.3	3	34.16	16	46.5	3	61.96	21	72.0	3
17.2	46.92	27	69.9	3	38.04	17	26.3	0	34.00	16	46.4	1	61.75	21	71.9	1
27.2	46.65	27	69.2	7	37.87	17	26.1	2	33.85	15	46.4	0	61.53	22	71.4	5
Oct. 7.2	46.41	24	68.2	10	37.72	15	25.6	5	33.70	15	46.5	1	61.33	20	70.5	9
17.1	46.20	21	66.9	13	37.59	13	24.8	8	33.58	12	46.8	3	61.16	17	69.1	14
27.1	46.05	15	65.3	16	37.49	10	23.8	10	33.49	9	47.3	5	61.01	15	67.4	17
Nov. 6.1	45.96	9	63.6	17	37.43	6	22.6	12	33.44	5	47.9	6	60.91	10	65.3	21
16.1	45.94	2	61.8	18	37.41	2	21.0	16	33.43	1	48.7	8	60.85	6	62.9	24
26.0	46.00	6	59.9	19	37.44	3	19.3	17	33.47	4	49.7	10	60.85	0	60.2	27
Dec. 6.0	46.14	14	58.1	18	37.52	8	17.4	19	33.56	9	50.8	11	60.90	5	57.3	29
16.0	46.36	22	56.4	17	37.65	13	15.3	21	33.70	14	52.1	13	61.00	10	54.3	30
25.9	46.65	29	54.9	15	37.82	17	13.2	21	33.88	18	53.5	14	61.16	16	51.2	31
35.9	47.00	35	53.6	13	38.03	21	11.1	21	34.10	22	54.9	14	61.36	20	48.2	30
Sec δ, Tan δ	1.663		−1.329		1.014		+0.167		1.003		−0.072		1.167		+0.602	
Mean Place	43ˢ.434		46″.54		35ˢ.800		28″.60		31ˢ.510		39″.92		59ˢ.921		68″.55	
D′ψ a, Dω a	+0.03		−0.03		0.00		0.00		0.00		0.00		−0.02		+0.01	
Dψ δ, Dω δ	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*d* Herculis. Mag. 5.3				η Ophiuchi. Mag. 2.6				η Scorpii. Mag. 3.4				ζ Draconis. Mag. 3.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 16 58		° ′ +33 41		h m 17 5		° ′ −15 37		h m 17 5		° ′ −43 7		h m 17 8		° ′ +65 48	
	s		″		s		″		s		″		s		″	
Jan. 0.9	24.57		16.9		25.57		17.2		57.94		41.4		29.36		57.4	
10.9	24.80	23	13.9	30	25.82	25	18.0	8	58.25	31	40.7	7	29.64	28	53.9	35
20.9	25.06	26	11.1	28	26.10	28	18.8	8	58.61	36	40.2	5	30.01	37	50.7	32
30.9	25.36	30	8.7	24	26.40	30	19.7	9	59.00	39	39.9	3	30.45	44	48.0	27
Feb. 9.8	25.68	32	6.7	20	26.71	31	20.5	8	59.41	41	39.8	1	30.96	51	45.7	23
19.8	26.01	33	5.2	15	27.04	33	21.3	8	59.83	42	40.0	2	31.51	55	44.1	16
Mar. 1.8	26.35	34	4.2	10	27.36	32	22.0	7	60.25	42	40.3	3	32.08	57	43.1	10
11.7	26.68	33	3.8	4	27.68	32	22.5	5	60.67	42	40.8	5	32.66	58	42.8	3
21.7	27.01	33	4.0	2	28.00	32	22.8	3	61.08	41	41.4	6	33.23	57	43.2	4
31.7	27.32	31	4.8	8	28.31	31	23.0	2	61.48	40	42.1	7	33.78	55	44.2	10
Apr. 10.7	27.61	29	6.0	12	28.60	29	23.1	1	61.86	38	42.9	8	34.28	50	45.8	16
20.6	27.88	27	7.8	18	28.87	27	23.1	0	62.22	36	43.8	9	34.73	45	48.0	22
30.6	28.12	24	9.9	21	29.13	26	22.9	2	62.55	33	44.9	11	35.11	38	50.6	26
May 10.6	28.32	20	12.3	24	29.36	23	22.6	3	62.85	30	46.0	11	35.41	30	53.5	29
20.6	28.49	17	14.9	26	29.57	21	22.3	3	63.11	26	47.2	12	35.63	22	56.7	32
30.5	28.62	13	17.6	27	29.74	17	22.0	3	63.34	23	48.4	12	35.77	14	60.0	33
June 9.5	28.71	9	20.4	28	29.88	14	21.6	4	63.52	18	49.6	12	35.82	5	63.4	34
19.5	28.76	5	23.1	27	29.99	11	21.3	3	63.65	13	50.9	13	35.77	5	66.7	33
29.4	28.76	0	25.6	25	30.06	7	20.9	4	63.73	8	52.1	12	35.64	13	69.8	31
July 9.4	28.72	4	28.0	24	30.09	3	20.6	3	63.77	4	53.3	12	35.42	22	72.7	29
19.4	28.65	7	30.1	21	30.08	1	20.3	3	63.75	2	54.4	11	35.13	29	75.3	26
29.4	28.53	12	32.0	19	30.03	5	20.1	2	63.67	8	55.3	9	34.76	37	77.5	22
Aug. 8.3	28.38	15	33.5	15	29.95	8	19.9	2	63.56	11	56.1	8	34.33	43	79.3	18
18.3	28.20	18	34.6	11	29.83	12	19.7	2	63.40	16	56.6	5	33.85	48	80.6	13
28.3	27.99	21	35.3	7	29.69	14	19.5	2	63.21	19	57.0	4	33.33	52	81.4	8
Sept. 7.3	27.77	22	35.6	3	29.54	15	19.3	2	63.00	21	57.0	0	32.78	55	81.8	4
17.2	27.54	23	35.5	1	29.38	16	19.1	2	62.78	22	56.8	2	32.23	55	81.6	2
27.2	27.32	22	34.9	6	29.22	16	18.9	2	62.56	22	56.4	4	31.67	56	80.9	7
Oct. 7.2	27.11	21	33.9	10	29.07	15	18.8	1	62.36	20	55.7	7	31.14	53	79.6	13
17.1	26.92	19	32.5	14	28.94	13	18.7	1	62.19	17	54.8	9	30.65	49	77.9	17
27.1	26.77	15	30.7	18	28.85	9	18.7	0	62.06	13	53.7	11	30.21	44	75.7	22
Nov. 6.1	26.66	11	28.6	21	28.79	6	18.8	1	61.98	8	52.4	13	29.84	37	73.0	27
16.1	26.60	6	26.1	25	28.78	1	18.9	1	61.95	3	51.1	13	29.55	29	70.0	30
26.0	26.58	2	23.3	28	28.82	4	19.2	3	62.00	5	49.8	13	29.35	20	66.7	33
Dec. 6.0	26.63	5	20.3	30	28.91	9	19.6	4	62.11	11	48.5	13	29.26	9	63.1	36
16.0	26.73	10	17.2	31	29.05	14	20.1	5	62.28	17	47.4	11	29.27	1	59.4	37
26.0	26.88	15	14.0	32	29.23	18	20.8	7	62.52	24	46.3	11	29.38	11	55.7	37
35.9	27.08	20	11.0	30	29.46	23	21.5	7	62.81	29	45.5	8	29.60	22	52.2	35
Sec δ, Tan δ	1.202		+0.666		1.038		−0.280		1.370		−0.937		2.441		+2.227	
Mean Place	25ˢ.780		31″.46		26ˢ.638		9″.36		59ˢ.442		37″.21		32ˢ.136		73″.61	
$D'_\psi a$, $D_\omega a$	−0.02		+0.01		+0.01		0.00		+0.02		−0.01		−0.06		+0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Herculis. Var. 3.1–3.9				δ Herculis. Mag. 3.2				π Herculis. Mag. 3.4				59 Apodis (G.). Mag. 5.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 10		+14 28		17 11		+24 55		17 12		+36 53		17 15		−80 46	
	s		″		s		″		s		″		s		″	
Jan. 0.9	42.47		63.3		28.76		70.6		1.72		65.4		13.66		56.5	
10.9	42.68	21	61.0	23	28.97	21	67.9	27	1.93	21	62.3	31	14.74	108	54.1	24
20.9	42.93	25	58.8	22	29.22	25	65.3	26	2.19	26	59.4	29	16.02	128	52.0	21
30.9	43.21	28	56.8	20	29.50	28	63.0	23	2.48	29	56.8	26	17.46	144	50.2	18
Feb. 9.8	43.50	29	55.1	17	29.80	30	61.1	19	2.80	32	54.7	21	19.02	156	49.0	12
19.8	43.80	30	53.8	13	30.11	31	59.6	15	3.13	33	53.1	16	20.68	166	48.1	9
Mar. 1.8	44.11	31	52.8	10	30.43	32	58.6	10	3.47	34	52.0	11	22.39	171	47.8	3
11.7	44.42	31	52.3	5	30.74	31	58.1	5	3.82	35	51.6	4	24.11	172	47.9	1
21.7	44.72	30	52.3	0	31.05	31	58.1	0	4.16	34	51.7	1	25.81	170	48.5	6
31.7	45.01	29	52.6	3	31.35	30	58.7	6	4.48	32	52.4	7	27.46	165	49.5	10
Apr. 10.7	45.28	27	53.4	8	31.64	29	59.7	10	4.79	31	53.6	12	29.03	157	50.9	14
20.6	45.54	26	54.6	12	31.90	26	61.1	14	5.07	28	55.4	18	30.49	146	52.6	17
30.6	45.78	24	56.0	14	32.14	24	62.9	18	5.32	25	57.5	21	31.82	133	54.7	21
May 10.6	45.99	21	57.7	17	32.36	22	65.0	21	5.54	22	60.0	25	32.99	117	57.1	24
20.6	46.17	18	59.6	19	32.54	18	67.3	23	5.73	19	62.7	27	33.97	98	59.7	26
30.5	46.33	16	61.6	20	32.69	15	69.7	24	5.87	14	65.5	28	34.76	79	62.5	28
June 9.5	46.45	12	63.6	20	32.80	11	72.2	25	5.97	10	68.4	29	35.33	57	65.4	29
19.5	46.53	8	65.5	19	32.87	7	74.6	24	6.03	6	71.3	29	35.67	34	68.3	29
29.4	46.58	5	67.4	19	32.91	4	77.0	24	6.04	1	74.0	27	35.78	11	71.2	29
July 9.4	46.59	1	69.2	18	32.90	1	79.2	22	6.01	3	76.6	26	35.65	13	74.0	28
19.4	46.56	3	70.8	16	32.85	5	81.1	19	5.93	8	78.9	23	35.30	35	76.6	26
29.4	46.49	7	72.2	14	32.77	8	82.8	17	5.81	12	80.9	20	34.73	57	78.9	23
Aug. 8.3	46.39	10	73.4	12	32.65	12	84.3	15	5.65	16	82.6	17	33.96	77	80.9	20
18.3	46.26	13	74.4	10	32.50	15	85.4	11	5.47	18	83.9	13	33.03	93	82.4	15
28.3	46.11	15	75.0	6	32.33	17	86.2	8	5.25	22	84.7	8	31.96	107	83.5	11
Sept. 7.3	45.94	17	75.4	4	32.14	19	86.6	4	5.02	23	85.2	5	30.81	115	84.1	6
17.2	45.77	17	75.5	1	31.94	20	86.6	0	4.78	24	85.2	0	29.62	119	84.1	0
27.2	45.59	18	75.3	2	31.74	20	86.3	3	4.54	24	84.7	5	28.43	119	83.5	6
Oct. 7.2	45.43	16	74.8	5	31.55	19	85.6	7	4.31	23	83.8	9	27.31	112	82.4	11
17.1	45.28	15	73.9	9	31.38	17	84.5	11	4.10	21	82.5	13	26.30	101	80.8	16
27.1	45.16	12	72.8	11	31.24	14	83.0	15	3.92	18	80.7	18	25.45	85	78.7	21
Nov. 6.1	45.08	8	71.4	14	31.14	10	81.2	18	3.79	13	78.6	21	24.81	64	76.2	25
16.1	45.04	4	69.7	17	31.09	5	79.1	21	3.70	9	76.1	25	24.41	40	73.4	28
26.0	45.05	1	67.8	19	31.08	1	76.8	23	3.67	3	73.3	28	24.28	13	70.5	29
Dec. 6.0	45.11	6	65.7	21	31.12	4	74.2	26	3.69	2	70.3	30	24.42	14	67.4	31
16.0	45.22	11	63.5	22	31.22	10	71.4	28	3.77	8	67.1	32	24.84	42	64.4	30
26.0	45.37	15	61.1	24	31.36	14	68.6	28	3.90	13	63.9	32	25.52	68	61.5	29
35.9	45.56	19	58.8	23	31.55	19	65.8	28	4.09	19	60.7	32	26.45	93	58.8	27
Sec δ, Tan δ	1.033		+0.258		1.103		+0.465		1.251		+0.751		6.245		−6.164	
Mean Place	43ˢ.527		75″.19		29ˢ.906		83″.70		3ˢ.050		79″.62		21ˢ.406		54″.88	
D′ψ α, Dω α	−0.01		0.00		−0.01		+0.01		−0.02		+0.01		+0.16		−0.08	
Dψ δ, Dω δ	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Ophiuchi.** Mag. 3.4				**w Herculis.** Mag. 5.4				**β Aræ.** Mag. 2.8				**b Ophiuchi.** Mag. 4.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 16		−24 54		17 17		+32 34		17 18		−55 26		17 21		−24 5	
°	s		″		s		″		s		″		s		″	
Jan. 0.9	42.41		59.7		25.16		25.9		6.87		62.4		5.80		57.3	
10.9	42.66	25	59.9	2	25.37	21	22.9	30	7.24	37	61.0	14	6.05	25	57.5	2
20.9	42.95	29	60.2	3	25.62	25	20.1	28	7.66	42	59.8	12	6.33	28	57.9	4
30.9	43.26	31	60.6	4	25.90	28	17.5	26	8.13	47	58.9	9	6.64	31	58.3	4
Feb. 9.8	43.59	33	61.1	5	26.20	30	15.4	21	8.63	50	58.3	6	6.96	32	58.8	5
19.8	43.93	34	61.6	5	26.52	32	13.8	16	9.14	51	58.0	3	7.30	34	59.2	4
Mar. 1.8	44.28	35	62.0	4	26.85	33	12.7	11	9.67	53	57.9	1	7.64	34	59.6	4
11.8	44.62	34	62.4	4	27.19	34	12.1	6	10.20	53	58.1	2	7.98	34	60.0	4
21.7	44.96	34	62.8	4	27.51	32	12.2	1	10.72	52	58.6	5	8.32	34	60.3	3
31.7	45.29	33	63.1	3	27.83	32	12.8	6	11.22	50	59.3	7	8.65	33	60.6	3
Apr. 10.7	45.60	31	63.3	2	28.13	30	13.9	11	11.71	49	60.3	10	8.97	32	60.8	2
20.6	45.90	30	63.5	2	28.41	28	15.5	16	12.17	46	61.5	12	9.27	30	60.9	1
30.6	46.18	28	63.7	2	28.66	25	17.5	20	12.60	43	62.9	14	9.55	28	61.0	1
May 10.6	46.44	26	63.9	2	28.88	22	19.8	23	12.99	39	64.4	15	9.81	26	61.1	1
20.6	46.67	23	64.0	1	29.07	19	22.3	25	13.33	34	66.0	16	10.04	23	61.2	1
30.5	46.87	20	64.1	1	29.22	15	25.0	27	13.62	29	67.8	18	10.24	20	61.3	1
June 9.5	47.03	16	64.3	2	29.33	11	27.7	27	13.85	23	69.7	19	10.41	17	61.4	1
19.5	47.15	12	64.5	2	29.40	7	30.4	27	14.02	17	71.5	18	10.54	13	61.5	1
29.5	47.24	9	64.6	1	29.43	3	33.0	26	14.12	10	73.4	19	10.62	8	61.6	1
July 9.4	47.28	4	64.8	2	29.42	1	35.5	25	14.16	4	75.2	18	10.67	5	61.7	1
19.4	47.28	0	65.0	2	29.36	6	37.7	22	14.13	3	76.8	16	10.67	0	61.9	2
29.4	47.24	4	65.2	2	29.26	10	39.6	19	14.03	10	78.3	15	10.64	3	62.0	1
Aug. 8.3	47.16	8	65.3	1	29.12	14	41.2	16	13.88	15	79.6	13	10.56	8	62.1	1
18.3	47.05	11	65.4	1	28.95	17	42.5	13	13.67	21	80.6	10	10.45	11	62.2	1
28.3	46.91	14	65.4	0	28.75	20	43.3	8	13.42	25	81.2	6	10.31	14	62.2	0
Sept. 7.3	46.74	17	65.3	1	28.54	21	43.8	5	13.14	28	81.5	3	10.15	16	62.2	0
17.2	46.57	17	65.2	1	28.32	22	43.9	1	12.84	30	81.5	0	9.98	17	62.1	1
27.2	46.40	17	65.0	2	28.09	23	43.5	4	12.54	30	81.0	5	9.80	18	61.9	2
Oct. 7.2	46.24	16	64.7	3	27.88	21	42.7	8	12.26	28	80.2	8	9.64	16	61.6	3
17.2	46.10	14	64.3	4	27.69	19	41.4	13	12.02	24	79.1	11	9.50	14	61.3	3
27.1	45.99	11	64.0	3	27.52	17	39.8	16	11.82	20	77.6	15	9.39	11	61.0	3
Nov. 6.1	45.92	7	63.7	3	27.40	12	37.8	20	11.68	14	75.9	17	9.32	7	60.7	3
16.1	45.90	2	63.3	4	27.32	8	35.5	23	11.62	6	74.1	18	9.29	3	60.4	3
26.0	45.93	3	63.0	3	27.29	3	32.8	27	11.64	2	72.1	20	9.32	3	60.1	3
Dec. 6.0	46.02	9	62.8	2	27.31	2	29.9	29	11.74	10	70.2	19	9.40	8	60.0	1
16.0	46.16	14	62.7	1	27.39	8	26.9	30	11.93	19	68.2	20	9.54	14	59.9	1
26.0	46.34	18	62.7	0	27.53	14	23.8	31	12.19	26	66.4	18	9.72	18	60.0	1
35.9	46.57	23	62.9	2	27.71	18	20.7	31	12.52	33	64.9	15	9.94	22	60.2	2
Sec δ, Tan δ	1.103		−0.465		1.187		+0.639		1.763		−1.452		1.095		−0.447	
Mean Place	43ˢ.575		52″.76		26ˢ.437		39″.51		8ˢ.881		58″.82		6ˢ.965		50″.14	
D′ψ α, Dω α	+0.01		−0.01		−0.02		+0.01		+0.04		−0.02		+0.01		−0.01	
Dψ δ, Dω δ	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Ophiuchi. Mag. 4.4 Right Ascension.		σ Ophiuchi. Declination N.		δ Aræ. Mag. 3.8 Right Ascension.		δ Aræ. Declination S.		α Aræ. Mag. 3.0 Right Ascension.		α Aræ. Declination S.		λ Herculis. Mag. 4.5 Right Ascension.		λ Herculis. Declin tion N
	h m 17 22		° ′ + 4 12		h m 17 23		° ′ −60 36		h m 17 25		° ′ −49 48		h m 17 27		° +26
	s		″		s		″		s		″		s		″
Jan. 0.9	13.77	22	41.2	18	17.46	40	52.7	17	9.73	33	37.5	12	14.53	20	16.6
10.9	13.99	24	39.4	18	17.86	47	51.0	15	10.06	37	36.3	10	14.73	24	13.8
20.9	14.23	27	37.6	16	18.33	52	49.5	12	10.43	41	35.3	8	14.97	26	11.2
30.9	14.50	29	36.0	14	18.85	56	48.3	8	10.84	44	34.5	5	15.23	29	8.9
Feb. 9.8	14.79	30	34.6	11	19.41	58	47.5	6	11.28	46	34.0	3	15.52	31	6.9
19.8	15.09	30	33.5	9	19.99	60	46.9	2	11.74	47	33.7	0	15.83	31	5.3
Mar. 1.8	15.39	30	32.6	5	20.59	60	46.7	1	12.21	47	33.7	1	16.14	32	4.2
11.8	15.69	30	32.1	1	21.19	60	46.8	5	12.68	46	33.8	4	16.46	32	3.7
21.7	15.99	30	32.0	2	21.79	58	47.3	7	13.14	46	34.2	6	16.78	30	3.6
31.7	16.29	28	32.2	5	22.37	56	48.0	10	13.60	44	34.8	7	17.08	30	4.1
Apr. 10.7	16.57	26	32.7	8	22.93	53	49.0	12	14.04	41	35.5	10	17.38	27	5.1
20.6	16.83	25	33.5	11	23.46	49	50.2	15	14.45	39	36.5	11	17.65	26	6.5
30.6	17.08	23	34.6	13	23.95	45	51.7	17	14.84	36	37.6	12	17.91	22	8.4
May 10.6	17.31	20	35.9	14	24.40	39	53.4	18	15.20	31	38.8	13	18.13	20	10.5
20.6	17.51	17	37.3	15	24.79	33	55.2	20	15.51	27	40.1	15	18.33	16	12.8
30.5	17.68	14	38.8	15	25.12	26	57.2	21	15.78	23	41.6	15	18.49	13	15.3
June 9.5	17.82	10	40.3	15	25.38	19	59.3	21	16.01	17	43.1	16	18.62	9	17.9
19.5	17.92	7	41.8	15	25.57	12	61.4	21	16.18	11	44.7	15	18.71	5	20.4
29.5	17.99	3	43.3	13	25.69	4	63.5	20	16.29	5	46.2	16	18.76	0	22.9
July 9.4	18.02	1	44.6	12	25.73	4	65.5	19	16.34	1	47.8	14	18.76	3	25.2
19.4	18.01	4	45.8	11	25.69	12	67.4	17	16.33	7	49.2	13	18.73	8	27.3
29.4	17.97	8	46.9	10	25.57	19	69.1	15	16.26	12	50.5	11	18.65	11	29.2
Aug. 8.3	17.89	11	47.9	7	25.38	24	70.6	12	16.14	17	51.6	9	18.54	15	30.8
18.3	17.78	14	48.6	6	25.14	30	71.8	8	15.97	21	52.5	6	18.39	17	32.0
28.3	17.64	16	49.2	3	24.84	33	72.6	4	15.76	24	53.1	3	18.22	19	32.9
Sept. 7.3	17.48	16	49.5	2	24.51	35	73.0	0	15.52	26	53.4	0	18.03	21	33.5
17.2	17.32	17	49.7	1	24.16	35	73.0	4	15.26	26	53.4	4	17.82	20	33.7
27.2	17.15	16	49.6	3	23.81	33	72.6	8	15.00	24	53.0	6	17.62	20	33.4
Oct. 7.2	16.99	14	49.3	5	23.48	30	71.8	12	14.76	22	52.4	10	17.42	18	32.8
17.2	16.85	11	48.8	7	23.18	24	70.6	16	14.54	17	51.4	12	17.24	15	31.9
27.1	16.74	8	48.1	9	22.94	17	69.0	18	14.37	12	50.2	14	17.09	11	30.5
Nov. 6.1	16.66	3	47.2	11	22.77	9	67.2	20	14.25	5	48.8	16	16.98	8	28.8
16.1	16.63	1	46.1	14	22.68	0	65.2	22	14.20	1	47.2	17	16.90	2	26.8
26.0	16.64	5	44.7	15	22.68	9	63.0	22	14.21	9	45.5	17	16.88	2	24.4
Dec. 6.0	16.69	11	43.2	17	22.77	19	60.8	22	14.30	16	43.8	16	16.90	8	21.9
16.0	16.80	15	41.5	17	22.96	28	58.6	21	14.46	23	42.2	15	16.98	13	19.2
26.0	16.95	19	39.8	18	23.24	36	56.5	19	14.69	29	40.7	13	17.11	17	16.3
35.9	17.14		38.0		23.60		54.6		14.98		39.4		17.28		13.5
Sec δ, Tan δ	1.003		+0.074		2.038		−1.776		1.550		−1.184		1.114		+0.491
Mean Place	14ˢ.826		51″.71		19ˢ.820		49″.14		11ˢ.474		32″.89		15ˢ.750		29″.25
D′ψ a, Dω a	0.00		0.00		+0.05		−0.02		+0.03		−0.01		−0.01		0.00
Dψ δ, Dω δ	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**λ Scorpii.** Mag. 1.7				**β Draconis.** Mag. 3.0				**α Ophiuchi.** Mag. 2.1				**ξ Serpentis.** Mag. 3.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 27		−37 2		17 28		+52 21		17 30		+12 36		17 32		−15 20	
	s		″		s		″		s		″		s		″	
Jan. 1.0	44.65		37.1		27.41		38.4		55.40		67.1		38.54		51.1	
		28		5		20		35		20		22		22		7
10.9	44.93		36.6		27.61		34.9		55.60		64.9		38.76		51.8	
		31		4		27		32		24		21		26		8
20.9	45.24		36.2		27.88		31.7		55.84		62.8		39.02		52.6	
		34		2		32		28		26		19		28		7
30.9	45.58		36.0		28.20		28.9		56.10		60.9		39.30		53.3	
		36		1		35		24		28		17		30		7
Feb. 9.8	45.94		35.9		28.55		26.5		56.38		59.2		39.60		54.0	
		38		0		39		19		29		13		32		6
19.8	46.32		35.9		28.94		24.6		56.67		57.9		39.92		54.6	
		39		1		41		12		30		9		32		5
Mar. 1.8	46.71		36.0		29.35		23.4		56.97		57.0		40.24		55.1	
		39		3		42		6		31		6		32		4
11.8	47.10		36.3		29.77		22.8		57.28		56.4		40.56		55.5	
		38		3		41		1		30		1		32		2
21.7	47.48		36.6		30.18		22.9		57.58		56.3		40.88		55.7	
		37		4		41		7		30		3		31		0
31.7	47.85		37.0		30.59		23.6		57.88		56.6		41.19		55.7	
		37		4		38		14		28		7		30		1
Apr. 10.7	48.22		37.4		30.97		25.0		58.16		57.3		41.49		55.6	
		34		5		35		19		27		11		29		2
20.7	48.56		37.9		31.32		26.9		58.43		58.4		41.78		55.4	
		32		6		31		23		25		14		27		3
30.6	48.88		38.5		31.63		29.2		58.68		59.8		42.05		55.1	
		30		6		27		27		23		16		26		5
May 10.6	49.18		39.1		31.90		31.9		58.91		61.4		42.31		54.6	
		27		7		22		30		20		18		23		4
20.6	49.45		39.8		32.12		34.9		59.11		63.2		42.54		54.2	
		24		8		16		32		18		19		20		5
30.5	49.69		40.6		32.28		38.1		59.29		65.1		42.74		53.7	
		19		8		11		33		14		20		16		5
June 9.5	49.88		41.4		32.39		41.4		59.43		67.1		42.90		53.2	
		15		9		5		33		10		19		13		4
19.5	50.03		42.3		32.44		44.7		59.53		69.0		43.03		52.8	
		11		8		2		31		7		19		10		4
29.5	50.14		43.1		32.42		47.8		59.60		70.9		43.13		52.4	
		5		9		7		30		3		18		5		4
July 9.4	50.19		44.0		32.35		50.8		59.63		72.7		43.18		52.0	
		1		8		13		27		1		16		1		3
19.4	50.20		44.8		32.22		53.5		59.62		74.3		43.19		51.7	
		4		7		18		24		5		15		3		2
29.4	50.16		45.5		32.04		55.9		59.57		75.8		43.16		51.5	
		9		7		24		20		9		12		6		3
Aug. 8.4	50.07		46.2		31.80		57.9		59.48		77.0		43.10		51.2	
		13		5		27		16		12		10		10		1
18.3	49.94		46.7		31.53		59.5		59.36		78.0		43.00		51.1	
		16		3		31		11		14		7		13		2
28.3	49.78		47.0		31.22		60.6		59.22		78.7		42.87		50.9	
		18		1		33		7		16		5		15		1
Sept. 7.3	49.60		47.1		30.89		61.3		59.06		79.2		42.72		50.8	
		20		0		35		1		17		2		16		1
17.2	49.40		47.1		30.54		61.4		58.89		79.4		42.56		50.7	
		20		2		35		3		18		1		17		1
27.2	49.20		46.9		30.19		61.1		58.71		79.3		42.39		50.6	
		19		5		34		9		17		4		16		1
Oct. 7.2	49.01		46.4		29.85		60.2		58.54		78.9		42.23		50.5	
		17		6		31		14		15		7		14		0
17.2	48.84		45.8		29.54		58.8		58.39		78.2		42.09		50.5	
		14		8		28		18		13		9		11		0
27.1	48.70		45.0		29.26		57.0		58.26		77.3		41.98		50.5	
		8		9		24		23		9		13		8		1
Nov. 6.1	48.62		44.1		29.02		54.7		58.17		76.0		41.90		50.6	
		4		9		18		27		5		15		3		1
16.1	48.58		43.2		28.84		52.0		58.12		74.5		41.87		50.7	
		2		10		12		31		1		17		1		2
26.1	48.60		42.2		28.72		48.9		58.11		72.8		41.88		50.9	
		8		10		4		33		4		19		6		4
Dec. 6.0	48.68		41.2		28.68		45.6		58.15		70.9		41.94		51.3	
		14		8		2		34		9		21		12		5
16.0	48.82		40.4		28.70		42.2		58.24		68.8		42.06		51.8	
		19		8		10		36		13		22		16		5
26.0	49.01		39.6		28.80		38.6		58.37		66.6		42.22		52.3	
		25		7		16		35		18		23		20		7
35.9	49.26		38.9		28.96		35.1		58.55		64.3		42.42		53.0	
Sec δ, Tan δ	1.253		−0.755		1.638		+1.297		1.025		+0.224		1.037		−0.274	
Mean Place	46ˢ.020		31″.12		29ˢ.330		52″.67		56ˢ.506		78″.43		39ˢ.643		42″.68	
D′ψα, Dωα	+0.02		−0.01		−0.03		+0.01		−0.01		0.00		+0.01		0.00	
Dψδ, Dωδ	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Herculis. Mag. 3.8				η Pavonis. Mag. 3.6				ω Draconis. Mag. 4.9				β Ophiuchi. Mag. 2.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 37		+46 2		17 37		−64 40		17 37		+68 47		17 39		+ 4 35	
	s		″		s		″		s		″		s		″	
Jan. 1.0	0.55	19	52.4	34	14.55	42	67.2	20	23.68	23	37.9	35	12.34	20	58.4	18
10.9	0.74	24	49.0	31	14.97	50	65.2	18	23.91	33	34.4	33	12.54	23	56.6	18
20.9	0.98	28	45.9	28	15.47	57	63.4	15	24.24	43	31.1	30	12.77	26	54.8	16
30.9	1.26	32	43.1	24	16.04	61	61.9	12	24.67	51	28.1	25	13.03	27	53.2	13
Feb. 9.8	1.58	35	40.7	19	16.65	65	60.7	8	25.18	57	25.6	19	13.30	29	51.9	11
19.8	1.93	37	38.8	13	17.30	67	59.9	5	25.75	62	23.7	13	13.59	30	50.8	9
Mar. 1.8	2.30	38	37.5	7	17.97	68	59.4	1	26.37	64	22.4	6	13.89	30	49.9	5
11.8	2.68	38	36.8	0	18.65	68	59.3	2	27.01	64	21.8	0	14.19	30	49.4	1
21.7	3.06	37	36.8	6	19.33	67	59.5	5	27.65	63	21.8	7	14.49	30	49.3	2
31.7	3.43	35	37.4	12	20.00	64	60.0	9	28.28	60	22.5	14	14.79	29	49.5	6
Apr. 10.7	3.78	32	38.6	18	20.64	61	60.9	11	28.88	54	23.9	19	15.08	27	50.1	8
20.7	4.10	30	40.4	22	21.25	58	62.0	14	29.42	46	25.8	23	15.35	26	50.9	12
30.6	4.40	26	42.6	26	21.83	52	63.4	17	29.88	40	28.1	28	15.61	24	52.1	13
May 10.6	4.66	22	45.2	29	22.35	47	65.1	19	30.28	30	30.9	32	15.85	21	53.4	14
20.6	4.88	17	48.1	30	22.82	39	67.0	20	30.58	21	34.1	33	16.06	19	54.8	16
30.5	5.05	13	51.1	32	23.21	32	69.0	22	30.79	10	37.4	33	16.25	15	56.4	16
June 9.5	5.18	7	54.3	32	23.53	24	71.2	22	30.89	1	40.7	34	16.40	12	58.0	16
19.5	5.25	2	57.5	31	23.77	15	73.4	23	30.90	10	44.1	34	16.52	8	59.6	15
29.5	5.27	4	60.6	29	23.92	6	75.7	22	30.80	20	47.5	31	16.60	5	61.1	15
July 9.4	5.23	9	63.5	27	23.98	3	77.9	22	30.60	30	50.6	29	16.65	0	62.6	13
19.4	5.14	13	66.2	24	23.95	12	80.1	19	30.30	38	53.5	25	16.65	3	63.9	12
29.4	5.01	18	68.6	20	23.83	20	82.0	17	29.92	46	56.0	21	16.62	7	65.1	10
Aug. 8.4	4.83	23	70.6	17	23.63	28	83.7	14	29.46	53	58.1	18	16.55	11	66.1	8
18.3	4.60	25	72.3	12	23.35	33	85.1	10	28.93	58	59.9	13	16.44	13	66.9	6
28.3	4.35	28	73.5	7	23.02	38	86.1	6	28.35	62	61.2	7	16.31	15	67.5	4
Sept. 7.3	4.07	29	74.2	3	22.64	41	86.7	3	27.73	64	61.9	3	16.16	17	67.9	2
17.2	3.78	30	74.5	2	22.23	42	87.0	3	27.09	65	62.2	3	15.99	17	68.1	0
27.2	3.48	29	74.3	7	21.81	40	86.7	7	26.44	64	61.9	8	15.82	16	68.1	2
Oct. 7.2	3.19	27	73.6	12	21.41	36	86.0	12	25.80	60	61.1	13	15.66	15	67.9	4
17.2	2.92	24	72.4	17	21.05	31	84.8	15	25.20	55	59.8	18	15.51	12	67.5	7
27.1	2.68	20	70.7	21	20.74	23	83.3	19	24.65	49	58.0	23	15.39	9	66.8	9
Nov. 6.1	2.48	15	68.6	25	20.51	14	81.4	21	24.16	40	55.7	27	15.30	5	65.9	11
16.1	2.33	10	66.1	29	20.37	4	79.3	23	23.76	31	53.0	31	15.25	0	64.8	13
26.1	2.23	3	63.2	31	20.33	6	77.0	24	23.45	20	49.9	33	15.25	4	63.5	15
Dec. 6.0	2.20	3	60.1	33	20.39	18	74.6	25	23.25	9	46.6	36	15.29	9	62.0	16
16.0	2.23	9	56.8	34	20.57	27	72.1	23	23.16	4	43.0	36	15.38	13	60.4	17
26.0	2.32	15	53.4	34	20.84	37	69.8	22	23.20	15	39.4	36	15.51	17	58.7	18
35.9	2.47		50.0		21.21		67.6		23.35		35.8		15.68		56.9	
Sec δ, Tan δ	1.441		+1.037		2.339		−2.114		2.765		+2.577		1.003		+0.080	
Mean Place	2ˢ.246		65″.81		17ˢ.275		62″.91		27ˢ.202		51″.97		13ˢ.424		68″.76	
D′ψ α, Dω α	−0.03		+0.01		+0.05		−0.01		−0.07		+0.02		0.00		0.00	
Dψ δ, Dω δ	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ι^1 Scorpii.** Mag. 3.1				**μ Herculis.** Mag. 3.5				**ψ Draconis.** Mag. 4.9				**γ Ophiuchi.** Mag. 3.7			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 41		−40 5		17 43		+27 45		17 43		+72 10		17 43		+ 2 44	
	s		″		s		″		s		″		s		″	
Jan. 1.0	32.73	27	47.3	8	4.24	19	61.0	28	23.60	22	75.3	36	33.70	20	9.7	17
10.9	33.00	31	46.5	6	4.43	22	58.2	27	23.82	35	71.7	33	33.90	23	8.0	16
20.9	33.31	34	45.9	5	4.65	25	55.5	25	24.17	47	68.4	30	34.13	25	6.4	15
30.9	33.65	37	45.4	4	4.90	28	53.0	21	24.64	57	65.4	25	34.38	28	4.9	13
Feb. 9.9	34.02	39	45.0	2	5.18	30	50.9	17	25.21	65	62.9	20	34.66	29	3.6	11
19.8	34.41	39	44.8	1	5.48	31	49.2	12	25.86	71	60.9	14	34.95	30	2.5	8
Mar. 1.8	34.80	40	44.7	1	5.79	31	48.0	6	26.57	74	59.5	7	35.25	30	1.7	5
11.8	35.20	40	44.8	1	6.10	32	47.4	2	27.31	75	58.8	1	35.55	30	1.2	1
21.7	35.60	39	44.9	3	6.42	32	47.2	4	28.06	73	58.7	6	35.85	30	1.1	2
31.7	35.99	39	45.2	3	6.74	30	47.6	9	28.79	69	59.3	13	36.15	28	1.3	5
Apr. 10.7	36.38	37	45.5	5	7.04	28	48.5	14	29.48	63	60.6	18	36.43	28	1.8	8
20.7	36.75	34	46.0	6	7.32	27	49.9	18	30.11	55	62.4	23	36.71	26	2.6	10
30.6	37.09	33	46.6	6	7.59	24	51.7	22	30.66	46	64.7	28	36.97	24	3.6	13
May 10.6	37.42	29	47.2	8	7.83	21	53.9	23	31.12	36	67.5	31	37.21	22	4.9	14
20.6	37.71	26	48.0	8	8.04	18	56.2	26	31.48	24	70.6	32	37.43	19	6.3	15
30.6	37.97	21	48.8	9	8.22	14	58.8	26	31.72	12	73.8	34	37.62	16	7.8	15
June 9.5	38.18	18	49.7	10	8.36	10	61.4	26	31.84	1	77.2	34	37.78	13	9.3	15
19.5	38.36	12	50.7	10	8.46	6	64.0	26	31.83	12	80.6	33	37.91	9	10.8	14
29.5	38.48	7	51.7	10	8.52	2	66.6	24	31.71	25	83.9	31	38.00	5	12.2	14
July 9.4	38.55	2	52.7	10	8.54	3	69.0	23	31.46	35	87.0	29	38.05	1	13.6	12
19.4	38.57	3	53.7	9	8.51	7	71.3	20	31.11	46	89.9	26	38.06	3	14.8	11
29.4	38.54	8	54.6	8	8.44	11	73.3	17	30.65	56	92.5	22	38.03	7	15.9	10
Aug. 8.4	38.46	13	55.4	7	8.33	14	75.0	14	30.09	63	94.7	18	37.96	10	16.9	7
18.3	38.33	16	56.1	5	8.19	17	76.4	11	29.46	70	96.5	13	37.86	13	17.6	6
28.3	38.17	19	56.6	3	8.02	19	77.5	6	28.76	74	97.8	9	37.73	15	18.2	4
Sept. 7.3	37.98	21	56.9	1	7.83	21	78.1	3	28.02	77	98.7	3	37.58	16	18.6	2
17.3	37.77	21	57.0	2	7.62	21	78.4	1	27.25	78	99.0	2	37.42	17	18.8	0
27.2	37.56	20	56.8	4	7.41	21	78.3	5	26.47	77	98.8	7	37.25	16	18.8	2
Oct. 7.2	37.36	19	56.4	6	7.20	19	77.8	9	25.70	74	98.1	13	37.09	15	18.6	4
17.2	37.17	15	55.8	8	7.01	16	76.9	13	24.96	68	96.8	17	36.94	12	18.2	6
27.1	37.02	11	55.0	9	6.85	14	75.6	16	24.28	61	95.1	22	36.82	9	17.6	8
Nov. 6.1	36.91	5	54.1	11	6.71	9	74.0	20	23.67	51	92.9	27	36.73	5	16.8	10
16.1	36.86	0	53.0	12	6.62	4	72.0	23	23.16	40	90.2	30	36.68	1	15.8	12
26.1	36.86	6	51.8	11	6.58	0	69.7	26	22.76	28	87.2	33	36.67	4	14.6	14
Dec. 6.0	36.92	13	50.7	11	6.58	6	67.1	28	22.48	15	83.9	35	36.71	8	13.2	15
16.0	37.05	18	49.6	10	6.64	11	64.3	28	22.33	0	80.4	37	36.79	13	11.7	16
26.0	37.23	24	48.6	9	6.75	15	61.5	29	22.33	13	76.7	36	36.92	18	10.1	16
35.9	37.47		47.7		6.90		58.6		22.46		73.1		37.10		8.5	
Sec δ, Tan δ	1.307		−0.842		1.130		+0.526		3.269		+3.112		1.001		+0.048	
Mean Place	34ˢ.168		40″.90		5ˢ.531		73″.09		27ˢ.881		88″.83		34ˢ.791		19″.88	
$D'_\psi\alpha$, $D_\omega\alpha$	+0.02		0.00		−0.01		0.00		−0.08		+0.01		0.00		0.00	
$D_\psi\delta$, $D_\omega\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	89 Herculis. Mag. 5.5				ξ Draconis. Mag. 3.9				35 Draconis. Mag. 5.0				θ Herculis. Mag. 4.0		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declin tion N
	h m		° ′		h m		° ′		h m		° ′		h m		°
	17 51		+26 3		17 52		+56 52		17 53		+76 58		17 53		+37
	s		″		s		″		s		″		s		″
Jan. 1.0	55.76	18	35.2	27	0.24	17	56.4	35	11.81	21	17.1	35	16.70	17	28.6
10.9	55.94	21	32.5	26	0.41	24	52.9	34	12.02	40	13.6	33	16.87	21	25.5
20.9	56.15	24	29.9	24	0.65	31	49.5	30	12.42	56	10.3	30	17.08	26	22.5
30.9	56.39	28	27.5	21	0.96	36	46.5	26	12.98	70	7.3	26	17.34	28	19.8
Feb. 9.9	56.67	29	25.4	16	1.32	40	43.9	20	13.68	83	4.7	21	17.62	31	17.5
19.8	56.96	31	23.8	12	1.72	43	41.9	15	14.51	91	2.6	15	17.93	33	15.6
Mar. 1.8	57.27	31	22.6	7	2.15	45	40.4	8	15.42	97	1.1	8	18.26	34	14.2
11.8	57.58	31	21.9	2	2.60	45	39.6	2	16.39	98	0.3	1	18.60	34	13.5
21.7	57.89	31	21.7	4	3.05	45	39.4	5	17.37	98	0.2	5	18.94	34	13.3
31.7	58.20	31	22.1	9	3.50	43	39.9	11	18.35	92	0.7	11	19.28	32	13.7
Apr. 10.7	58.51	29	23.0	13	3.93	40	41.0	18	19.27	85	1.8	18	19.60	31	14.7
20.7	58.80	27	24.3	17	4.33	36	42.8	22	20.12	75	3.6	22	19.91	29	16.2
30.6	59.07	24	26.0	21	4.69	32	45.0	27	20.87	62	5.8	27	20.20	26	18.2
May 10.6	59.31	22	28.1	24	5.01	27	47.7	30	21.49	47	8.5	30	20.46	23	20.6
20.6	59.53	19	30.5	25	5.28	20	50.7	32	21.96	32	11.5	32	20.69	19	23.2
30.6	59.72	15	33.0	26	5.48	14	53.9	33	22.28	16	14.7	33	20.88	15	26.1
June 9.5	59.87	12	35.6	26	5.62	8	57.2	34	22.44	1	18.0	34	21.03	10	29.1
19.5	59.99	7	38.2	26	5.70	0	60.6	33	22.43	18	21.4	33	21.13	5	32.1
29.5	60.06	2	40.8	24	5.70	6	63.9	32	22.25	34	24.7	32	21.18	1	35.0
July 9.4	60.08	1	43.2	23	5.64	13	67.1	30	21.91	49	27.9	30	21.19	3	37.8
19.4	60.07	6	45.5	20	5.51	19	70.1	26	21.42	64	30.9	26	21.16	9	40.4
29.4	60.01	9	47.5	18	5.32	25	72.7	23	20.78	76	33.5	23	21.07	13	42.8
Aug. 8.4	59.92	13	49.3	14	5.07	30	75.0	19	20.02	87	35.8	20	20.94	17	44.8
18.3	59.79	16	50.7	11	4.77	34	76.9	15	19.15	96	37.8	14	20.77	20	46.5
28.3	59.63	19	51.8	8	4.43	37	78.4	10	18.19	103	39.2	10	20.57	22	47.8
Sept. 7.3	59.44	20	52.6	4	4.06	40	79.4	5	17.16	107	40.2	5	20.35	24	48.7
17.3	59.24	21	53.0	0	3.66	40	79.9	1	16.09	109	40.7	0	20.11	25	49.2
27.2	59.03	20	53.0	4	3.26	40	79.8	5	15.00	108	40.7	6	19.86	24	49.2
Oct. 7.2	58.83	19	52.6	8	2.86	38	79.3	11	13.92	104	40.1	10	19.62	23	48.7
17.2	58.64	17	51.8	12	2.48	35	78.2	16	12.88	98	39.1	16	19.39	21	47.8
27.1	58.47	13	50.6	15	2.13	30	76.6	20	11.90	88	37.5	21	19.18	17	46.4
Nov. 6.1	58.34	9	49.1	19	1.83	24	74.6	25	11.02	77	35.4	24	19.01	13	44.7
16.1	58.25	5	47.2	21	1.59	18	72.1	29	10.25	62	33.0	29	18.88	7	42.5
26.1	58.20	0	45.1	25	1.41	11	69.2	32	9.63	46	30.1	32	18.81	3	40.0
Dec. 6.0	58.20	5	42.6	26	1.30	4	66.0	34	9.17	28	26.9	34	18.78	3	37.2
16.0	58.25	10	40.0	27	1.26	5	62.6	36	8.89	10	23.5	35	18.81	8	34.1
26.0	58.35	15	37.3	28	1.31	13	59.0	35	8.79	9	20.0	36	18.89	14	31.0
36.0	58.50		34.5		1.44		55.5		8.88		16.4		19.03		27.9
Sec δ, Tan δ	1.113		+0.489		1.830		+1.533		4.436		+4.322		1.256		+0.761
Mean Place	$57^{\mathrm{s}}.048$		$46''.83$		$2^{\mathrm{s}}.570$		$69''.09$		$17^{\mathrm{s}}.870$		$29''.76$		$18^{\mathrm{s}}.206$		$40''.65$
$D'_{\psi} a$, $D_{\omega} a$	−0.01		0.00		−0.04		0.00		−0.11		+0.01		−0.02		0.00
$D_{\psi} \delta$, $D_{\omega} \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Ophiuchi. Mag. 3.5				ξ Herculis. Mag. 3.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′	
	17 54		− 9 45		17 54		+29 14	
	s		″		s		″	
Jan. 1.0	16.39		59.3		24.04		71.8	
10.9	16.59	20	60.3	10	24.21	17	68.9	29
20.9	16.82	23	61.2	9	24.42	21	66.2	27
30.9	17.07	25	62.1	9	24.67	25	63.7	25
Feb. 9.9	17.35	28	62.9	8	24.94	27	61.5	22
19.8	17.65	30	63.6	7	25.23	29	59.8	17
Mar. 1.8	17.95	30	64.1	5	25.54	31	58.5	13
11.8	18.26	31	64.4	3	25.86	32	57.8	7
21.7	18.57	31	64.5	1	26.18	32	57.6	2
31.7	18.88	31	64.4	1	26.50	32	58.0	4
Apr. 10.7	19.18	30	64.0	4	26.81	31	58.9	9
20.7	19.48	30	63.5	5	27.10	29	60.3	14
30.6	19.76	28	62.9	6	27.38	28	62.1	18
May 10.6	20.02	26	62.1	8	27.63	25	64.3	22
20.6	20.25	23	61.3	8	27.86	23	66.7	24
30.6	20.46	21	60.4	9	28.05	19	69.3	26
June 9.5	20.65	19	59.6	8	28.20	15	72.0	27
19.5	20.79	14	58.7	9	28.31	11	74.8	28
29.5	20.90	11	57.9	8	28.38	7	77.5	27
July 9.4	20.97	7	57.2	7	28.41	3	80.0	25
19.4	21.00	3	56.6	6	28.39	2	82.4	24
29.4	20.99	1	56.0	6	28.33	6	84.6	22
Aug. 8.4	20.93	6	55.6	4	28.23	10	86.4	18
18.3	20.84	9	55.2	4	28.09	14	87.9	15
28.3	20.72	12	54.9	3	27.92	17	89.1	12
Sept. 7.3	20.58	14	54.7	2	27.72	20	90.0	9
17.3	20.42	16	54.6	1	27.51	21	90.4	4
27.2	20.26	16	54.6	0	27.30	21	90.4	0
Oct. 7.2	20.10	16	54.6	0	27.08	22	90.0	4
17.2	19.95	15	54.7	1	26.88	20	89.2	8
27.1	19.83	12	54.9	2	26.71	17	88.0	12
Nov. 6.1	19.74	9	55.2	3	26.57	14	86.4	16
16.1	19.68	6	55.6	4	26.46	11	84.5	19
26.1	19.68	0	56.2	6	26.40	6	82.2	23
Dec. 6.0	19.72	4	56.8	6	26.40	0	79.7	25
16.0	19.80	8	57.5	7	26.44	4	76.9	28
26.0	19.93	13	58.4	9	26.53	9	74.1	28
36.0	20.11	18	59.3	9	26.67	14	71.2	29
Sec δ, Tan δ	1.015		−0.172		1.146		+0.560	
Mean Place	$17^{s}.488$		$50''.10$		$25^{s}.383$		$83''.40$	
D′ψa, Dωa	0.00		0.00		−0.01		0.00	
Dψδ, Dωδ	0.0		−1.0		0.0		−1.0	

Mean Solar Date.	γ Draconis. Mag. 2.4				67 Ophiuchi. Mag. 3.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′	
	17 54		+51 29		17 56		+ 2 55	
	s		″		s		″	
Jan. 1.0	34.52		42.4		19.18		55.5	
10.9	34.68	16	39.0	34	19.37	19	53.9	16
20.9	34.91	23	35.7	33	19.58	21	52.3	16
30.9	35.19	28	32.7	30	19.83	25	50.8	15
Feb. 9.9	35.52	33	30.1	26	20.10	27	49.5	13
19.8	35.88	36	28.1	20	20.38	28	48.5	10
Mar. 1.8	36.27	39	26.6	15	20.67	29	47.7	8
11.8	36.67	40	25.8	8	20.97	30	47.2	5
21.7	37.08	41	25.6	2	21.27	30	47.1	1
31.7	37.48	40	26.0	4	21.57	30	47.3	2
Apr. 10.7	37.87	39	27.1	11	21.86	29	47.9	6
20.7	38.24	37	28.8	17	22.15	29	48.7	8
30.6	38.58	34	31.0	22	22.42	27	49.8	11
May 10.6	38.87	29	33.6	26	22.67	25	51.1	13
20.6	39.13	26	36.5	29	22.89	22	52.5	14
30.6	39.33	20	39.6	31	23.09	20	54.0	15
June 9.5	39.47	14	42.9	33	23.27	18	55.6	16
19.5	39.56	9	46.2	33	23.41	14	57.1	15
29.5	39.59	3	49.5	33	23.50	9	58.6	15
July 9.4	39.55	4	52.6	31	23.56	6	60.1	15
19.4	39.46	9	55.5	29	23.58	2	61.4	13
29.4	39.31	15	58.1	26	23.57	1	62.5	11
Aug. 8.4	39.11	20	60.4	23	23.51	6	63.5	10
18.3	38.86	25	62.3	19	23.41	10	64.3	8
28.3	38.58	28	63.8	15	23.29	12	64.9	6
Sept. 7.3	38.26	32	64.8	10	23.14	15	65.4	5
17.3	37.92	34	65.3	5	22.98	16	65.6	2
27.2	37.58	34	65.3	0	22.81	17	65.7	1
Oct. 7.2	37.24	34	64.8	5	22.65	16	65.5	2
17.2	36.92	32	63.8	10	22.50	15	65.1	4
27.1	36.63	29	62.3	15	22.37	13	64.6	5
Nov. 6.1	36.38	25	60.3	20	22.27	10	63.8	8
16.1	36.17	21	57.9	24	22.21	6	62.8	10
26.1	36.02	15	55.1	28	22.19	2	61.7	11
Dec. 6.0	35.94	8	52.0	31	22.22	3	60.3	14
16.0	35.93	1	48.6	34	22.29	7	58.9	14
26.0	35.98	5	45.1	35	22.41	12	57.3	16
36.0	36.11	13	41.7	34	22.57	16	55.6	17
Sec δ, Tan δ	1.606		+1.257		1.001		+0.051	
Mean Place	$36^{s}.540$		$54''.83$		$20^{s}.287$		$65''.64$	
D′ψa, Dωa	−0.03		0.00		0.00		0.00	
Dψδ, Dωδ	0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Aræ. Mag. 3.9				γ Sagittarii. Mag. 3.1				70 Ophiuchi. Mag. 4.1				72 Ophiuchi. Mag. 3.7			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 17 59		° ′ −50 5		h m 18 0		° ′ −30 25		h m 18 1		° ′ + 2 30		h m 18 3		° ′ + 9 32	
	s		″		s		″		s		″		s		″	
Jan. 1.0	54.43	28	61.4	15	15.67	22	42.0	3	5.36	18	56.9	16	15.17	18	52.9	20
10.9	54.71	33	59.9	13	15.89	26	41.7	2	5.54	21	55.3	16	15.35	20	50.9	19
20.9	55.04	38	58.6	12	16.15	29	41.5	2	5.75	24	53.7	15	15.55	24	49.0	17
30.9	55.42	41	57.4	9	16.44	32	41.3	2	5.99	27	52.2	13	15.79	26	47.3	16
Feb. 9.9	55.83	44	56.5	8	16.76	34	41.1	1	6.26	28	50.9	11	16.05	27	45.7	12
19.8	56.27	45	55.7	5	17.10	35	41.0	0	6.54	29	49.8	8	16.32	29	44.5	9
Mar. 1.8	56.72	47	55.2	3	17.45	35	41.0	0	6.83	30	49.0	4	16.61	30	43.6	6
11.8	57.19	47	54.9	1	17.80	36	41.0	0	7.13	30	48.6	2	16.91	30	43.0	1
21.8	57.66	46	54.8	1	18.16	35	41.0	1	7.43	30	48.4	2	17.21	30	42.9	3
31.7	58.12	46	54.9	3	18.51	35	40.9	0	7.73	30	48.6	5	17.51	29	43.2	6
Apr. 10.7	58.58	44	55.2	5	18.86	34	40.9	1	8.03	28	49.1	8	17.80	29	43.8	10
20.7	59.02	42	55.7	7	19.20	33	41.0	0	8.31	27	49.9	11	18.09	27	44.8	13
30.6	59.44	39	56.4	9	19.53	30	41.0	1	8.58	26	51.0	12	18.36	25	46.1	15
May 10.6	59.83	36	57.3	11	19.83	28	41.1	1	8.84	23	52.2	14	18.61	23	47.6	18
20.6	60.19	32	58.4	12	20.11	25	41.2	2	9.07	21	53.6	15	18.84	21	49.4	18
30.6	60.51	27	59.6	13	20.36	22	41.4	3	9.28	17	55.1	15	19.05	17	51.2	19
June 9.5	60.78	22	60.9	15	20.58	17	41.7	4	9.45	14	56.6	15	19.22	14	53.1	20
19.5	61.00	16	62.4	15	20.75	13	42.1	4	9.59	11	58.1	15	19.36	10	55.1	18
29.5	61.16	10	63.9	15	20.88	9	42.5	4	9.70	6	59.6	14	19.46	5	56.9	18
July 9.5	61.26	3	65.4	15	20.97	4	42.9	5	9.76	3	61.0	13	19.51	2	58.7	16
19.4	61.29	2	66.9	15	21.01	0	43.4	5	9.79	2	62.3	11	19.53	2	60.3	15
29.4	61.27	9	68.4	13	21.01	6	43.9	5	9.77	5	63.4	9	19.51	6	61.8	13
Aug. 8.4	61.18	14	69.7	11	20.95	9	44.4	4	9.72	9	64.3	8	19.45	9	63.1	10
18.3	61.04	19	70.8	9	20.86	13	44.8	3	9.63	12	65.1	6	19.36	13	64.1	9
28.3	60.85	23	71.7	6	20.73	16	45.1	2	9.51	15	65.7	4	19.23	15	65.0	6
Sept. 7.3	60.62	25	72.3	3	20.57	18	45.3	2	9.36	16	66.1	2	19.08	17	65.6	3
17.3	60.37	26	72.6	0	20.39	18	45.5	1	9.20	16	66.3	0	18.91	17	65.9	0
27.2	60.11	25	72.6	3	20.21	19	45.4	1	9.04	17	66.3	1	18.74	18	65.9	2
Oct. 7.2	59.86	24	72.3	7	20.02	17	45.3	3	8.87	15	66.2	4	18.56	16	65.7	4
17.2	59.62	21	71.6	9	19.85	14	45.0	4	8.72	13	65.8	6	18.40	14	65.3	7
27.2	59.41	16	70.7	13	19.71	11	44.6	5	8.59	10	65.2	7	18.26	10	64.6	10
Nov. 6.1	59.25	10	69.4	14	19.60	6	44.1	5	8.49	6	64.5	10	18.16	8	63.6	12
16.1	59.15	3	68.0	16	19.54	1	43.6	6	8.43	3	63.5	12	18.08	3	62.4	14
26.1	59.12	4	66.4	17	19.53	4	43.0	6	8.40	3	62.3	13	18.05	1	61.0	17
Dec. 6.0	59.16	11	64.7	17	19.57	9	42.4	5	8.43	7	61.0	15	18.06	6	59.3	18
16.0	59.27	17	63.0	16	19.66	15	41.9	5	8.50	11	59.5	15	18.12	11	57.5	19
26.0	59.44	25	61.4	16	19.81	19	41.4	4	8.61	16	58.0	16	18.23	15	55.6	19
36.0	59.69		59.8		20.00		41.0		8.77		56.4		18.38		53.7	
Sec δ, Tan δ	1.559		−1.196		1.160		−0.587		1.001		+0.044		1.014		+0.168	
Mean Place	$56^{s}.156$		$54''.65$		$16^{s}.926$		$34''.07$		$6^{s}.465$		$66''.93$		$16^{s}.318$		$63''.28$	
$D'_{\psi}a$, $D_{\omega}a$	+0.03		0.00		+0.02		0.00		0.00		0.00		0.00		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**o Herculis.** Mag. 3.8				**μ Sagittarii.** Mag. 4.0				**η Sagittarii.** Mag. 3.2				**Groombridge 2533.** Mag. 5.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 18 4		° ′ +28 44		h m 18 8		° ′ −21 4		h m 18 11		° ′ −36 47		h m 18 12		° ′ +42 7	
	s		″		s		″		s		″		s		″	
Jan. 1.0	9.88		48.7		36.02		64.9		47.17		25.9		56.55		35.2	
11.0	10.04	16	45.9	28	36.22	20	65.1	2	47.39	22	25.1	8	56.69	14	31.9	33
20.9	10.24	20	43.2	27	36.46	24	65.3	2	47.66	27	24.4	7	56.88	19	28.8	31
30.9	10.48	24	40.7	25	36.72	26	65.5	2	47.96	30	23.8	6	57.12	24	25.9	29
Feb. 9.9	10.74	26	38.5	22	37.01	29	65.8	3	48.29	33	23.3	5	57.40	28	23.4	25
19.8	11.03	29	36.7	18	37.32	31	66.0	2	48.64	35	22.9	4	57.71	31	21.4	20
Mar. 1.8	11.33	30	35.4	13	37.63	31	66.1	1	49.01	37	22.6	3	58.04	33	19.8	16
11.8	11.65	32	34.7	7	37.96	33	66.1	0	49.38	37	22.3	3	58.39	35	18.8	10
21.8	11.97	32	34.5	2	38.29	33	66.1	0	49.76	38	22.1	2	58.75	36	18.5	3
31.7	12.29	32	34.8	3	38.62	33	65.9	2	50.14	38	22.0	1	59.10	35	18.8	3
Apr. 10.7	12.60	31	35.6	8	38.94	32	65.7	2	50.52	38	22.0	0	59.45	35	19.7	9
20.7	12.90	30	37.0	14	39.26	32	65.4	3	50.89	37	22.1	1	59.79	34	21.2	15
30.7	13.18	28	38.7	17	39.57	31	65.1	3	51.24	35	22.2	1	60.10	31	23.1	19
May 10.6	13.44	26	40.8	21	39.85	28	64.7	4	51.57	33	22.4	2	60.39	29	25.4	23
20.6	13.67	23	43.2	24	40.12	27	64.3	4	51.88	31	22.8	4	60.64	25	28.1	27
30.6	13.86	19	45.8	26	40.36	24	64.0	3	52.16	28	23.3	5	60.85	21	31.1	30
June 9.5	14.03	17	48.6	28	40.57	21	63.7	3	52.40	24	23.8	5	61.02	17	34.2	31
19.5	14.15	12	51.3	27	40.74	17	63.4	3	52.60	20	24.5	7	61.15	13	37.4	32
29.5	14.23	8	54.0	27	40.87	13	63.3	1	52.76	16	25.2	7	61.22	7	40.5	31
July 9.5	14.27	4	56.6	26	40.96	9	63.1	2	52.86	10	26.0	8	61.24	2	43.6	31
19.4	14.26	1	59.0	24	41.00	4	63.1	0	52.91	5	26.8	8	61.21	3	46.4	28
29.4	14.20	6	61.2	22	41.01	1	63.1	0	52.91	0	27.7	9	61.12	9	49.0	26
Aug. 8.4	14.11	9	63.1	19	40.96	5	63.1	0	52.86	5	28.5	8	60.99	13	51.4	24
18.4	13.98	13	64.7	16	40.88	8	63.2	1	52.77	9	29.2	7	60.82	17	53.3	19
28.3	13.82	16	66.0	13	40.76	12	63.3	1	52.63	14	29.8	6	60.61	21	54.9	16
Sept. 7.3	13.63	19	66.9	9	40.62	14	63.4	1	52.46	17	30.2	4	60.37	24	56.1	12
17.3	13.42	21	67.4	5	40.46	16	63.4	0	52.27	19	30.5	3	60.10	27	56.8	7
27.2	13.21	21	67.5	1	40.29	17	63.4	0	52.07	20	30.5	0	59.83	27	57.0	2
Oct. 7.2	13.00	21	67.2	3	40.12	17	63.3	1	51.87	20	30.4	1	59.56	27	56.8	2
17.2	12.79	21	66.5	7	39.96	16	63.3	0	51.68	19	30.1	3	59.30	26	56.0	8
27.2	12.61	18	65.4	11	39.83	13	63.2	1	51.52	16	29.6	5	59.06	24	54.8	12
Nov. 6.1	12.47	14	63.9	15	39.73	10	63.1	1	51.39	13	28.9	7	58.85	21	53.2	16
16.1	12.36	11	62.1	18	39.66	7	62.9	2	51.31	8	28.1	8	58.69	16	51.1	21
26.1	12.29	7	59.9	22	39.64	2	62.8	1	51.28	3	27.2	9	58.57	12	48.6	25
Dec. 6.1	12.27	2	57.4	25	39.67	3	62.8	0	51.31	3	26.2	10	58.51	6	45.8	28
16.0	12.31	4	54.7	27	39.75	8	62.8	0	51.40	9	25.3	9	58.50	1	42.8	30
26.0	12.39	8	51.9	28	39.88	13	62.9	1	51.54	14	24.4	9	58.55	5	39.6	32
36.0	12.52	13	49.1	28	40.06	18	63.0	1	51.73	19	23.5	9	58.66	11	36.3	33
Sec δ, Tan δ	1.141		+0.549		1.072		−0.386		1.249		−0.748		1.348		+0.905	
Mean Place	$11^{s}.240$		59″.83		$37^{s}.182$		56″.12		$48^{s}.517$		17″.81		$58^{s}.254$		46″.12	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		0.00		+0.01		0.00		+0.02		0.00		−0.02		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**36 Draconis.** Mag. 5.0				**δ Sagittarii.** Mag. 2.8				**η Serpentis.** Mag. 3.4				**ε Sagittarii.** Mag. 2.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 13		+64 21		18 15		−29 51		18 16		− 2 55		18 18		−34 25	
	s		″		s		″		s		″		s		″	
Jan. 1.0	20.94		53.8		28.06		64.9		50.43		28.5		26.51		42.5	
11.0	21.07	13	50.2	36	28.27	21	64.5	4	50.60	17	29.7	12	26.72	21	41.9	6
20.9	21.30	23	46.8	34	28.51	24	64.2	3	50.80	20	31.0	13	26.97	25	41.3	6
30.9	21.61	31	43.6	32	28.79	28	63.9	3	51.03	23	32.1	11	27.26	29	40.7	6
Feb. 9.9	22.00	39	40.8	28	29.09	30	63.7	2	51.29	26	33.1	10	27.58	32	40.3	4
19.8	22.45	45	38.5	23	29.42	33	63.5	2	51.56	27	34.0	9	27.91	33	39.9	4
Mar. 1.8	22.95	50	36.8	17	29.76	34	63.3	2	51.85	29	34.6	6	28.27	36	39.5	4
11.8	23.48	53	35.7	11	30.11	35	63.1	2	52.14	29	34.9	3	28.63	36	39.3	2
21.8	24.03	55	35.3	4	30.46	35	62.9	2	52.45	31	35.0	1	29.00	37	39.0	3
31.7	24.58	55	35.6	3	30.81	35	62.8	1	52.75	30	34.8	2	29.37	37	38.8	2
Apr. 10.7	25.11	53	36.5	9	31.16	35	62.6	2	53.05	30	34.3	5	29.74	37	38.7	1
20.7	25.62	51	38.0	15	31.51	35	62.5	1	53.34	29	33.6	7	30.10	36	38.6	1
30.7	26.08	46	40.1	21	31.84	33	62.4	1	53.62	28	32.6	10	30.45	35	38.6	0
May 10.6	26.49	41	42.7	26	32.15	31	62.3	1	53.89	27	31.5	11	30.78	33	38.7	1
20.6	26.83	34	45.6	29	32.44	29	62.3	0	54.14	25	30.3	12	31.08	30	38.9	2
30.6	27.10	27	48.8	32	32.70	26	62.4	1	54.36	22	29.0	13	31.36	28	39.2	3
June 9.5	27.28	18	52.2	34	32.93	23	62.5	1	54.55	19	27.7	13	31.60	24	39.6	4
19.5	27.38	10	55.6	34	33.12	19	62.8	3	54.71	16	26.4	13	31.80	20	40.1	5
29.5	27.40	2	59.1	35	33.27	15	63.1	3	54.83	12	25.2	12	31.96	16	40.7	6
July 9.5	27.33	7	62.4	33	33.38	11	63.5	4	54.91	8	24.0	12	32.07	11	41.3	6
19.4	27.17	16	65.6	32	33.43	5	63.9	4	54.96	5	23.0	10	32.13	6	42.0	7
29.4	26.93	24	68.5	29	33.44	1	64.4	5	54.96	0	22.1	9	32.14	1	42.7	7
Aug. 8.4	26.62	31	71.1	26	33.40	4	64.8	4	54.92	4	21.3	8	32.10	4	43.4	7
18.4	26.24	38	73.3	22	33.32	8	65.3	5	54.84	8	20.7	6	32.01	9	44.0	6
28.3	25.81	43	75.1	18	33.20	12	65.7	4	54.72	12	20.2	5	31.89	12	44.6	6
Sept. 7.3	25.33	48	76.4	13	33.04	16	66.0	3	54.59	13	19.8	4	31.73	16	45.0	4
17.3	24.82	51	77.2	8	32.87	17	66.1	1	54.44	15	19.6	2	31.54	19	45.3	3
27.2	24.29	53	77.5	3	32.69	18	66.2	1	54.27	17	19.6	0	31.35	19	45.4	1
Oct. 7.2	23.76	53	77.2	3	32.50	19	66.1	1	54.11	16	19.7	1	31.16	19	45.3	1
17.2	23.25	51	76.5	7	32.33	17	66.0	1	53.95	16	19.9	2	30.97	19	45.1	2
27.2	22.77	48	75.2	13	32.18	15	65.6	4	53.81	14	20.3	4	30.81	16	44.7	4
Nov. 6.1	22.33	44	73.3	19	32.06	12	65.2	4	53.71	10	20.9	6	30.69	12	44.1	6
16.1	21.96	37	71.0	23	31.99	7	64.7	5	53.64	7	21.6	7	30.60	9	43.4	7
26.1	21.66	30	68.3	27	31.96	3	64.2	5	53.60	4	22.4	8	30.57	3	42.7	7
Dec. 6.1	21.44	22	65.2	31	31.99	3	63.6	6	53.62	2	23.4	10	30.59	2	41.9	8
16.0	21.32	12	61.9	33	32.07	8	63.1	5	53.67	5	24.5	11	30.67	8	41.1	8
26.0	21.29	3	58.4	35	32.20	13	62.6	5	53.77	10	25.7	12	30.80	13	40.3	8
36.0	21.36	7	54.8	36	32.37	17	62.2	4	53.92	15	26.9	12	30.98	18	39.5	8
Sec δ, Tan δ	2.312		+2.084		1.153		−0.574		1.001		−0.051		1.212		−0.685	
Mean Place	$24^s.114$		64″.71		$29^s.301$		56″.32		$51^s.539$		18″.81		$27^s.811$		34″.06	
$D'_\psi a$, $D_\omega a$	−0.06		−0.01		+0.02		0.00		0.00		0.00		+0.02		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**109 Herculis.** Mag. 3.9				**α Telescopii.** Mag. 3.8				**χ Draconis.** Mag. 3.7				**λ Sagittarii.** Mag. 2.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 20		+21 43		18 20		−46 1		18 22		+72 41		18 22		−25 28	
	s		″		s		″		s		″		s		″	
Jan. 1.0	0.69	15	36.9	26	34.26	24	9.0	14	31.75	10	34.6	35	38.61	19	21.9	1
11.0	0.84	19	34.3	24	34.50	28	7.6	12	31.85	24	31.1	35	38.80	23	21.8	1
20.9	1.03	22	31.9	23	34.78	33	6.4	12	32.09	38	27.6	32	39.03	26	21.7	1
30.9	1.25	24	29.6	20	35.11	37	5.2	10	32.47	49	24.4	29	39.29	29	21.6	1
Feb. 9.9	1.49	27	27.6	16	35.48	39	4.2	8	32.96	59	21.5	24	39.58	31	21.5	1
19.9	1.76	29	26.0	12	35.87	41	3.4	7	33.55	67	19.1	18	39.89	32	21.4	1
Mar. 1.8	2.05	30	24.8	8	36.28	43	2.7	5	34.22	73	17.3	12	40.21	33	21.3	1
11.8	2.35	31	24.0	2	36.71	43	2.2	4	34.95	76	16.1	5	40.54	34	21.2	2
21.8	2.66	31	23.8	2	37.14	43	1.8	2	35.71	77	15.6	1	40.88	34	21.0	2
31.7	2.97	30	24.0	7	37.57	43	1.6	0	36.48	74	15.7	8	41.22	34	20.8	3
Apr. 10.7	3.27	30	24.7	12	38.00	42	1.6	2	37.22	71	16.5	14	41.56	33	20.5	3
20.7	3.57	28	25.9	16	38.42	41	1.8	3	37.93	65	17.9	19	41.89	32	20.2	3
30.7	3.85	27	27.5	19	38.83	39	2.1	5	38.58	56	19.8	25	42.21	31	19.9	3
May 10.6	4.12	24	29.4	21	39.22	35	2.6	7	39.14	47	22.3	28	42.52	28	19.6	2
20.6	4.36	22	31.5	24	39.57	32	3.3	8	39.61	36	25.1	31	42.80	26	19.4	2
30.6	4.58	18	33.9	24	39.89	28	4.1	10	39.97	24	28.2	33	43.06	23	19.2	1
June 9.5	4.76	14	36.3	25	40.17	24	5.1	12	40.21	12	31.5	35	43.29	19	19.1	1
19.5	4.90	11	38.8	25	40.41	18	6.3	12	40.33	1	35.0	34	43.48	15	19.0	1
29.5	5.01	6	41.3	24	40.59	12	7.5	13	40.32	14	38.4	34	43.63	11	19.1	1
July 9.5	5.07	2	43.7	22	40.71	6	8.8	13	40.18	26	41.8	32	43.74	6	19.2	2
19.4	5.09	3	45.9	21	40.77	1	10.1	13	39.92	37	45.0	30	43.80	1	19.4	2
29.4	5.06	6	48.0	18	40.78	6	11.4	12	39.55	48	48.0	27	43.81	3	19.6	3
Aug. 8.4	5.00	11	49.8	15	40.72	11	12.6	11	39.07	58	50.7	23	43.78	7	19.9	3
18.4	4.89	14	51.3	12	40.61	15	13.7	9	38.49	66	53.0	19	43.71	11	20.2	2
28.3	4.75	16	52.5	9	40.46	20	14.6	7	37.83	73	54.9	14	43.60	15	20.4	2
Sept. 7.3	4.59	18	53.4	6	40.26	22	15.3	5	37.10	77	56.3	10	43.45	16	20.6	2
17.3	4.41	20	54.0	2	40.04	24	15.8	2	36.33	79	57.3	4	43.29	18	20.8	1
27.2	4.21	19	54.2	2	39.80	23	16.0	1	35.54	81	57.7	1	43.11	17	20.9	0
Oct. 7.2	4.02	19	54.0	5	39.57	23	15.9	4	34.73	79	57.6	6	42.94	17	20.9	1
17.2	3.83	16	53.5	8	39.34	20	15.5	7	33.94	75	57.0	12	42.77	15	20.8	2
27.2	3.67	14	52.7	13	39.14	16	14.8	9	33.19	69	55.8	16	42.62	11	20.6	2
Nov. 6.1	3.53	11	51.4	15	38.98	11	13.9	12	32.50	61	54.2	22	42.51	8	20.4	3
16.1	3.42	6	49.9	18	38.87	5	12.7	13	31.89	51	52.0	26	42.43	3	20.1	3
26.1	3.36	2	48.1	21	38.82	2	11.4	15	31.38	40	49.4	30	42.40	2	19.8	3
Dec. 6.1	3.34	3	46.0	24	38.84	7	9.9	15	30.98	27	46.4	32	42.42	7	19.5	3
16.0	3.37	8	43.6	24	38.91	14	8.4	15	30.71	13	43.2	35	42.49	11	19.2	2
26.0	3.45	12	41.2	25	39.05	20	6.9	14	30.58	1	39.7	36	42.60	17	19.0	2
36.0	3.57		38.7		39.25		5.5		30.59		36.1		42.77		18.8	
Sec δ, Tan δ	1.076		+0.398		1.440		−1.037		3.362		+3.209		1.108		−0.476	
Mean Place	1^{s}.973		47″.08		35^{s}.815		0″.90		36^{s}.588		44″.61		39^{s}.803		13″.00	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.01		0.00		+0.03		+0.01		−0.08		−0.02		+0.01		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*c* Serpentis. Mag. 5.4				1 Aquilæ. Mag. 4.1				ζ Pavonis. Mag. 4.1				α Lyræ. Mag. 0.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 25		− 2 2		18 30		− 8 18		18 32		−71 30		18 33		+38 41	
	s		″		s		″		s		″		s		″	
Jan. 1.0	11.32		39.9		30.52		27.6		55.87		20.5		59.95		61.4	
11.0	11.48	16	41.2	13	30.68	16	28.5	9	56.25	38	17.8	27	60.07	12	58.3	31
20.9	11.68	20	42.4	12	30.88	20	29.4	9	56.75	50	15.2	26	60.24	17	55.2	31
30.9	11.90	22	43.6	12	31.10	22	30.2	8	57.35	60	12.8	24	60.45	21	52.4	28
Feb. 9.9	12.15	25	44.6	10	31.35	25	30.9	7	58.04	69	10.7	21	60.70	25	49.9	25
19.9	12.42	27	45.4	8	31.62	27	31.5	6	58.80	76	8.9	18	60.98	28	47.8	21
Mar. 1.8	12.70	28	46.0	6	31.91	29	31.8	3	59.61	81	7.5	14	61.29	31	46.2	16
11.8	13.00	30	46.3	3	32.21	30	32.0	2	60.47	86	6.4	11	61.62	33	45.1	11
21.8	13.30	30	46.4	1	32.52	31	32.0	0	61.35	88	5.7	7	61.96	34	44.6	5
31.7	13.60	30	46.1	3	32.83	31	31.7	3	62.24	89	5.3	4	62.30	34	44.7	1
Apr. 10.7	13.90	30	45.6	5	33.13	30	31.2	5	63.12	88	5.4	1	62.64	34	45.5	8
20.7	14.20	30	44.8	8	33.44	31	30.5	7	63.99	87	5.8	4	62.98	34	46.7	12
30.7	14.48	28	43.8	10	33.73	29	29.7	8	64.82	83	6.6	8	63.30	32	48.5	18
May 10.6	14.75	27	42.6	12	34.01	28	28.7	10	65.60	78	7.8	12	63.59	29	50.7	22
20.6	15.01	26	41.3	13	34.27	26	27.7	10	66.31	71	9.3	15	63.86	27	53.3	26
30.6	15.24	23	40.0	13	34.51	24	26.6	11	66.95	64	11.1	18	64.10	24	56.1	28
June 9.6	15.44	20	38.6	14	34.72	21	25.5	11	67.49	54	13.1	20	64.29	19	59.2	31
19.5	15.60	16	37.2	14	34.90	18	24.5	10	67.93	44	15.4	23	64.44	15	62.3	31
29.5	15.73	13	35.8	14	35.04	14	23.5	10	68.25	32	17.8	24	64.54	10	65.4	31
July 9.5	15.82	9	34.6	12	35.14	10	22.6	9	68.45	20	20.3	25	64.59	5	68.4	30
19.4	15.87	5	33.5	11	35.20	6	21.8	8	68.53	8	22.8	25	64.59	0	71.4	30
29.4	15.88	1	32.5	10	35.21	1	21.1	7	68.48	5	25.2	24	64.55	4	74.1	27
Aug. 8.4	15.84	4	31.6	9	35.19	2	20.5	6	68.31	17	27.4	22	64.45	10	76.5	24
18.4	15.77	7	30.9	7	35.12	7	20.1	4	68.03	28	29.5	21	64.31	14	78.6	21
28.3	15.67	10	30.4	5	35.02	10	19.7	4	67.64	39	31.2	17	64.13	18	80.3	17
Sept. 7.3	15.54	13	30.0	4	34.89	13	19.5	2	67.17	47	32.5	13	63.92	21	81.6	13
17.3	15.38	16	29.7	3	34.74	15	19.4	1	66.63	54	33.4	9	63.68	24	82.6	10
27.3	15.22	16	29.6	1	34.58	16	19.4	0	66.06	57	33.8	4	63.43	25	83.1	5
Oct. 7.2	15.05	17	29.7	1	34.41	17	19.4	0	65.48	58	33.8	0	63.18	25	83.1	0
17.2	14.90	15	29.9	2	34.26	15	19.6	2	64.91	57	33.2	6	62.93	25	82.6	5
27.2	14.76	14	30.3	4	34.12	14	19.8	2	64.39	52	32.1	11	62.70	23	81.7	9
Nov. 6.1	14.65	11	30.9	6	34.01	11	20.2	4	63.94	45	30.5	16	62.50	20	80.3	14
16.1	14.57	8	31.6	7	33.93	8	20.6	4	63.59	35	28.6	19	62.34	16	78.5	18
26.1	14.53	4	32.4	8	33.89	4	21.2	6	63.35	24	26.3	23	62.21	13	76.3	22
Dec. 6.1	14.54	1	33.4	10	33.89	0	21.8	6	63.24	11	23.7	26	62.14	7	73.7	26
16.0	14.59	5	34.5	11	33.95	6	22.6	8	63.27	3	21.0	27	62.12	2	70.9	28
26.0	14.68	9	35.7	12	34.04	9	23.4	8	63.43	16	18.2	28	62.15	3	67.9	30
36.0	14.82	14	36.9	12	34.18	14	24.2	8	63.73	30	15.4	28	62.24	9	64.8	31
Sec δ, Tan δ	1.001		−0.036		1.011		−0.146		3.152		−2.990		1.282		+0.801	
Mean Place	12ˢ.430		30″.29		31ˢ.626		18″.11		59ˢ.375		12″.38		61ˢ.601		70″.86	
D′ψ α, Dω α	0.00		0.00		0.00		0.00		+0.08		+0.03		−0.02		−0.01	
Dψ δ, Dω δ	0.0		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	2 Aquilæ. Mag. 4.7				ϕ Sagittarii. Mag. 3.3				110 Herculis. Mag. 4.3				6 Aquilæ. Mag. 4.5			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 18 37		° ′ − 9 8		h m 18 40		° ′ −27 4		h m 18 41		° ′ +20 27		h m 18 42		° ′ − 4 50	
	s		″		s		″		s		″		s		″	
Jan. 1.0	32.85	16	18.0	8	15.83	18	57.7	3	56.29	13	38.3	24	35.58	14	36.1	11
11.0	33.01	19	18.8	8	16.01	21	57.4	3	56.42	16	35.9	24	35.72	18	37.2	10
20.9	33.20	22	19.6	7	16.22	25	57.1	3	56.58	20	33.5	22	35.90	22	38.2	9
30.9	33.42	25	20.3	6	16.47	27	56.8	3	56.78	23	31.3	19	36.12	23	39.1	8
Feb. 9.9	33.67	27	20.9	5	16.74	30	56.5	3	57.01	25	29.4	17	36.35	26	39.9	7
19.9	33.94	28	21.4	3	17.04	32	56.2	3	57.26	28	27.7	12	36.61	28	40.6	4
Mar. 1.8	34.22	30	21.7	1	17.36	33	55.9	3	57.54	29	26.5	8	36.89	29	41.0	3
11.8	34.52	30	21.8	1	17.69	34	55.6	4	57.83	30	25.7	4	37.18	30	41.3	1
21.8	34.82	31	21.7	3	18.03	34	55.2	4	58.13	31	25.3	2	37.48	30	41.2	3
31.8	35.13	31	21.4	5	18.37	35	54.8	4	58.44	30	25.5	6	37.78	31	40.9	5
Apr. 10.7	35.44	31	20.9	7	18.72	34	54.4	4	58.74	30	26.1	11	38.09	30	40.4	8
20.7	35.75	29	20.2	9	19.06	33	54.0	4	59.04	30	27.2	15	38.39	30	39.6	10
30.7	36.04	29	19.3	9	19.39	32	53.6	4	59.34	28	28.7	18	38.69	28	38.6	12
May 10.6	36.33	27	18.4	11	19.71	30	53.2	3	59.62	25	30.5	22	38.97	27	37.4	12
20.6	36.60	24	17.3	11	20.01	28	52.9	2	59.87	23	32.7	23	39.24	24	36.2	13
30.6	36.84	22	16.2	10	20.29	25	52.7	1	60.10	21	35.0	24	39.48	22	34.9	13
June 9.6	37.06	19	15.2	11	20.54	21	52,6	1	60.31	16	37.4	25	39.70	18	33.6	13
19.5	37.25	14	14.1	10	20.75	17	52.5	1	60.47	13	39.9	25	39.88	15	32.3	13
29.5	37.39	11	13.1	9	20.92	12	52.6	1	60.60	8	42.4	24	40.03	11	31.0	11
July 9.5	37.50	6	12.2	7	21.04	8	52.7	3	60.68	4	44.8	23	40.14	6	29.9	10
19.5	37.56	3	11.5	7	21.12	3	53.0	3	60.72	0	47.1	21	40.20	3	28.9	9
29.4	37.59	2	10.8	5	21.15	1	53.3	3	60.72	4	49.2	18	40.23	2	28.0	8
Aug. 8.4	37.57	6	10.3	5	21.14	6	53.6	4	60.68	9	51.0	16	40.21	6	27.2	6
18.4	37.51	10	9.8	3	21.08	10	54.0	4	60.59	13	52.6	14	40.15	9	26.6	5
28.3	37.41	13	9.5	2	20.98	14	54.4	3	60.46	15	54.0	10	40.06	13	26.1	3
Sept. 7.3	37.28	15	9.3	1	20.84	16	54.7	3	60.31	17	55.0	7	39.93	15	25.8	2
17.3	37.13	16	9.2	0	20.68	18	55.0	1	60.14	19	55.7	3	39.78	16	25.6	1
27.3	36.97	16	9.2	1	20.50	18	55.1	1	59.95	19	56.0	0	39.62	16	25.5	1
Oct. 7.2	36.81	16	9.3	1	20.32	17	55.2	0	59.76	19	56.0	3	39.46	16	25.6	1
17.2	36.65	14	9.4	2	20.15	16	55.2	1	59.57	17	55.7	7	39.30	14	25.7	3
27.2	36.51	11	9.6	3	19.99	12	55.1	3	59.40	14	55.0	10	39.16	12	26.0	5
Nov. 6.2	36.40	9	9.9	4	19.87	9	54.8	3	59.26	12	54.0	14	39.04	8	26.5	5
16.1	36.31	4	10.3	5	19.78	5	54.5	3	59.14	8	52.6	16	38.96	5	27.0	7
26.1	36.27	0	10.8	6	19.73	0	54.2	4	59.06	3	51.0	20	38.91	1	27.7	8
Dec. 6.1	36.27	4	11.4	7	19.73	5	53.8	4	59.03	1	49.0	21	38.90	4	28.5	9
16.0	36.31	9	12.1	7	19.78	10	53.4	4	59.04	5	46.9	23	38.94	8	29.4	10
26.0	36.40	14	12.8	8	19.88	15	53.0	4	59.09	10	44.6	24	39.02	12	30.4	10
36.0	36.54		13.6		20.03		52.6		59.19		42.2		39.14		31.4	
Sec δ, Tan δ	1.013		−0.161		1.123		−0.511		1.068		+0.373		1.004		−0.085	
Mean Place	$33^s.958$		8″.47		$17^s.018$		48″.32		$57^s.580$		47″.58		$36^s.682$		26″.64	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		0.00		+0.01		+0.01		−0.01		0.00		0.00		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**λ Pavonis.** Mag. 4.4				**β Lyræ.** Var. 3.4–4.1				**50 Draconis.** Mag. 5.4				**σ Sagittarii.** Mag. 2.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 18 44		° ′ −62 17		h m 18 46		° ′ +33 15		h m 18 49		° ′ +75 19		h m 18 49		° ′ −26 24	
	s		″		s		″		s		″		s		″	
Jan. 1.0	12.80		23.6		52.75		35.1		3.37		50.8		54.79		26.1	
11.0	13.07	27	21.3	23	52.86	11	32.2	29	3.36	1	47.3	35	54.95	16	25.8	3
21.0	13.42	35	19.0	23	53.01	15	29.4	28	3.52	16	43.9	34	55.15	20	25.5	3
30.9	13.83	41	16.9	21	53.20	19	26.7	27	3.84	32	40.6	33	55.39	24	25.2	3
Feb. 9.9	14.30	47	15.0	19	53.43	23	24.3	24	4.31	47	37.6	30	55.65	26	24.8	4
19.9	14.83	53	13.3	17	53.69	26	22.3	20	4.92	61	35.0	26	55.94	29	24.5	3
Mar. 1.8	15.39	56	11.9	14	53.98	29	20.7	16	5.63	71	32.9	21	56.25	31	24.2	3
11.8	15.98	59	10.8	11	54.29	31	19.6	11	6.43	80	31.4	15	56.58	33	23.8	4
21.8	16.60	62	9.9	9	54.61	32	19.1	5	7.28	85	30.5	9	56.91	33	23.3	5
31.8	17.22	62	9.4	5	54.94	33	19.2	1	8.16	88	30.3	2	57.25	34	22.8	5
Apr. 10.7	17.84	62	9.2	2	55.27	33	19.8	6	9.04	88	30.7	4	57.60	35	22.4	4
20.7	18.45	61	9.3	1	55.59	32	20.9	11	9.89	85	31.8	11	57.94	34	21.8	6
30.7	19.05	60	9.8	5	55.90	31	22.6	17	10.68	79	33.5	17	58.27	33	21.3	5
May 10.7	19.62	57	10.5	7	56.20	30	24.6	20	11.38	70	35.7	22	58.60	33	20.9	4
20.6	20.14	52	11.6	11	56.47	27	27.0	24	11.98	60	38.3	26	58.90	30	20.5	4
30.6	20.62	48	12.9	13	56.71	24	29.7	27	12.46	48	41.3	30	59.18	28	20.2	3
June 9.6	21.04	42	14.5	16	56.91	20	32.6	29	12.81	35	44.5	32	59.44	26	19.9	3
19.5	21.39	35	16.3	18	57.08	17	35.5	29	13.02	21	47.9	34	59.65	21	19.8	1
29.5	21.66	27	18.2	19	57.20	12	38.5	30	13.08	6	51.4	35	59.83	18	19.8	0
July 9.5	21.85	19	20.3	21	57.28	8	41.5	30	12.99	9	54.9	35	59.97	14	19.9	1
19.5	21.95	10	22.4	21	57.30	2	44.3	28	12.76	23	58.3	34	60.06	9	20.1	2
29.4	21.97	2	24.5	21	57.28	2	46.9	26	12.38	38	61.5	32	60.10	4	20.3	2
Aug. 8.4	21.89	8	26.5	20	57.21	7	49.2	23	11.87	51	64.4	29	60.08	2	20.7	4
18.4	21.74	15	28.3	18	57.10	11	51.3	21	11.24	63	67.1	27	60.03	5	21.0	3
28.3	21.51	23	29.8	15	56.95	15	53.0	17	10.51	73	69.3	22	59.94	9	21.4	4
Sept. 7.3	21.22	29	31.1	13	56.77	18	54.4	14	9.69	82	71.2	19	59.81	13	21.7	3
17.3	20.88	34	32.0	9	56.56	21	55.4	10	8.80	89	72.6	14	59.65	16	22.0	3
27.3	20.51	37	32.5	5	56.34	22	55.9	5	7.87	93	73.4	8	59.48	17	22.2	2
Oct. 7.2	20.13	38	32.6	1	56.11	23	56.0	1	6.91	96	73.8	4	59.30	18	22.4	2
17.2	19.76	37	32.3	3	55.88	23	55.7	3	5.96	95	73.7	1	59.13	17	22.4	0
27.2	19.41	35	31.5	8	55.67	21	54.9	8	5.03	93	73.0	7	58.97	16	22.3	1
Nov. 6.2	19.11	30	30.2	13	55.49	18	53.7	12	4.16	87	71.7	13	58.84	13	22.2	1
16.1	18.88	23	28.6	16	55.33	16	52.1	16	3.37	79	69.9	18	58.74	10	21.9	3
26.1	18.73	15	26.7	19	55.22	11	50.2	19	2.67	70	67.7	22	58.69	5	21.6	3
Dec. 6.1	18.66	7	24.6	21	55.15	7	47.9	23	2.10	57	65.1	26	58.68	1	21.3	3
16.0	18.69	3	22.3	23	55.13	2	45.3	26	1.67	43	62.1	30	58.72	4	20.9	4
26.0	18.81	12	19.9	24	55.16	3	42.5	28	1.40	27	58.8	33	58.81	9	20.6	3
36.0	19.02	21	17.4	25	55.24	8	39.6	29	1.29	11	55.3	35	58.94	13	20.2	4
Sec δ, Tan δ	2.150		−1.903		1.196		+0.656		3.949		+3.820		1.116		−0.496	
Mean Place	15ˢ.089		14″.55		54ˢ.275		43″.89		9ˢ.344		58″.17		55ˢ.954		16″.45	
D′ψ α, Dω α	+0.05		+0.02		−0.02		−0.01		−0.10		−0.05		+0.01		+0.01	
Dψ δ, Dω δ	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**o Draconis.** Mag. 4.8				**θ Serpentis** *pr.* Mag. 4.5				**R Lyræ.** Var. 4.0–4.7				**ε Aquilæ.** Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	^{h} ^{m} 18 49		° ′ +59 16		^{h} ^{m} 18 51		° ′ + 4 5		^{h} ^{m} 18 52		° ′ +43 49		^{h} ^{m} 18 55		° ′ +14 56	
	s		″		s		″		s		″		s		″	
Jan. 1.0	53.27	6	50.9	35	55.50	13	17.9	15	41.25	9	48.2	32	41.91	11	53.6	20
11.0	53.33	15	47.4	34	55.63	16	16.4	15	41.34	14	45.0	32	42.02	16	51.6	21
21.0	53.48	22	44.0	33	55.79	20	14.9	14	41.48	19	41.8	30	42.18	19	49.5	19
30.9	53.70	29	40.7	30	55.99	22	13.5	13	41.67	24	38.8	27	42.37	22	47.6	18
Feb. 9.9	53.99	35	37.7	25	56.21	25	12.2	10	41.91	28	36.1	23	42.59	24	45.8	14
19.9	54.34	39	35.2	20	56.46	27	11.2	7	42.19	30	33.8	18	42.83	26	44.4	11
Mar. 1.8	54.73	44	33.2	15	56.73	28	10.5	4	42.49	34	32.0	13	43.09	28	43.3	7
11.8	55.17	46	31.7	8	57.01	29	10.1	1	42.83	35	30.7	7	43.37	29	42.6	3
21.8	55.63	48	30.9	1	57.30	30	10.0	3	43.18	37	30.0	1	43.66	30	42.3	2
31.8	56.11	48	30.8	5	57.60	30	10.3	6	43.55	36	29.9	6	43.96	30	42.5	6
Apr. 10.7	56.59	46	31.3	12	57.90	30	10.9	9	43.91	36	30.5	11	44.26	31	43.1	10
20.7	57.05	44	32.5	17	58.20	29	11.8	12	44.27	35	31.6	17	44.57	29	44.1	14
30.7	57.49	41	34.2	22	58.49	28	13.0	15	44.62	32	33.3	22	44.86	28	45.5	17
May 10.7	57.90	36	36.4	27	58.77	27	14.5	16	44.94	30	35.5	26	45.14	27	47.2	19
20.6	58.26	30	39.1	31	59.04	24	16.1	17	45.24	26	38.1	28	45.41	24	49.1	21
30.6	58.56	24	42.2	33	59.28	22	17.8	17	45.50	22	40.9	31	45.65	22	51.2	23
June 9.6	58.80	18	45.5	34	59.50	19	19.5	18	45.72	17	44.0	33	45.87	18	53.5	23
19.5	58.98	10	48.9	35	59.69	15	21.3	18	45.89	12	47.3	32	46.05	14	55.8	23
29.5	59.08	2	52.4	35	59.84	10	23.1	16	46.01	6	50.5	33	46.19	10	58.1	22
July 9.5	59.10	5	55.9	33	59.94	7	24.7	16	46.07	1	53.8	31	46.29	6	60.3	21
19.5	59.05	12	59.2	32	60.01	3	26.3	14	46.08	4	56.9	30	46.35	2	62.4	19
29.4	58.93	20	62.4	29	60.04	2	27.7	12	46.04	10	59.9	27	46.37	3	64.3	17
Aug. 8.4	58.73	25	65.3	26	60.02	6	28.9	10	45.94	14	62.6	23	46.34	6	66.0	15
18.4	58.48	32	67.9	22	59.96	9	29.9	9	45.80	19	64.9	21	46.28	11	67.5	13
28.4	58.16	36	70.1	18	59.87	12	30.8	6	45.61	23	67.0	16	46.17	13	68.8	9
Sept. 7.3	57.80	40	71.9	13	59.75	15	31.4	4	45.38	25	68.6	12	46.04	16	69.7	7
17.3	57.40	42	73.2	8	59.60	17	31.8	2	45.13	27	69.8	7	45.88	17	70.4	4
27.3	56.98	43	74.0	3	59.43	16	32.0	0	44.86	29	70.5	2	45.71	19	70.8	0
Oct. 7.2	56.55	43	74.3	2	59.27	17	32.0	2	44.57	28	70.7	2	45.52	17	70.8	2
17.2	56.12	42	74.1	8	59.10	15	31.8	4	44.29	26	70.5	7	45.35	17	70.6	5
27.2	55.70	38	73.3	13	58.95	12	31.4	6	44.03	24	69.8	13	45.18	14	70.1	9
Nov. 6.2	55.32	34	72.0	18	58.83	10	30.8	9	43.79	20	68.5	17	45.04	11	69.2	11
16.1	54.98	28	70.2	22	58.73	6	29.9	10	43.59	16	66.8	21	44.93	8	68.1	14
26.1	54.70	21	68.0	27	58.67	2	28.9	12	43.43	12	64.7	25	44.85	4	66.7	16
Dec. 6.1	54.49	15	65.3	31	58.65	2	27.7	13	43.31	5	62.2	28	44.81	1	65.1	19
16.1	54.34	6	62.2	33	58.67	6	26.4	15	43.26	1	59.4	30	44.82	5	63.2	20
26.0	54.28	1	58.9	34	58.73	11	24.9	15	43.25	6	56.4	32	44.87	9	61.2	20
36.0	54.29		55.5		58.84		23.4		43.31		53.2		44.96		59.2	
Sec δ, Tan δ	1.958		+1.683		1.003		+0.071		1.386		+0.960		1.035		+0.267	
Mean Place	$56^{s}.066$		$58''.67$		$56^{s}.635$		$27''.15$		$43^{s}.110$		$56''.24$		$43^{s}.135$		$62''.48$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.04		−0.02		0.00		0.00		−0.02		−0.01		−0.01		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Lyræ. Mag. 3.3				ζ Sagittarii. Mag. 2.7				ζ Aquilæ. Mag. 3.0				λ Aquilæ. Mag. 3.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 18 55 s		° ′ +32 33 ″		h m 18 57 s		° ′ −30 0 ″		h m 19 1 s		° ′ +13 43 ″		h m 19 1 s		° ′ − 5 0 ″	
Jan. 1.0	42.04		67.0		7.24		24.9		26.21		56.8		40.00		53.3	
		11		28		16		5		11		20		13		10
11.0	42.15		64.2		7.40		24.4		26.32		54.8		40.13		54.3	
		14		28		20		6		15		20		17		9
21.0	42.29		61.4		7.60		23.8		26.47		52.8		40.30		55.2	
		18		27		24		5		19		19		19		9
30.9	42.47		58.7		7.84		23.3		26.66		50.9		40.49		56.1	
		22		24		27		6		21		16		22		8
Feb. 9.9	42.69		56.3		8.11		22.7		26.87		49.3		40.71		56.9	
		26		21		29		6		24		14		25		5
19.9	42.95		54.2		8.40		22.1		27.11		47.9		40.96		57.4	
		28		16		31		5		26		11		27		4
Mar. 1.8	43.23		52.6		8.71		21.6		27.37		46.8		41.23		57.8	
		30		11		33		6		27		7		28		2
11.8	43.53		51.5		9.04		21.0		27.64		46.1		41.51		58.0	
		31		5		35		5		29		2		29		1
21.8	43.84		51.0		9.39		20.5		27.93		45.9		41.80		57.9	
		33		0		35		6		30		1		30		4
31.8	44.17		51.0		9.74		19.9		28.23		46.0		42.10		57.5	
		33		6		35		5		30		6		31		6
Apr. 10.7	44.50		51.6		10.09		19.4		28.53		46.6		42.41		56.9	
		32		11		35		6		30		10		31		9
20.7	44.82		52.7		10.44		18.8		28.83		47.6		42.72		56.0	
		32		16		35		4		30		14		30		10
30.7	45.14		54.3		10.79		18.4		29.13		49.0		43.02		55.0	
		30		20		34		4		29		16		29		12
May 10.7	45.44		56.3		11.13		18.0		29.42		50.6		43.31		53.8	
		27		24		32		4		27		19		27		13
20.6	45.71		58.7		11.45		17.6		29.69		52.5		43.58		52.5	
		25		26		29		2		24		21		26		14
30.6	45.96		61.3		11.74		17.4		29.93		54.6		43.84		51.1	
		21		28		27		1		22		22		23		14
June 9.6	46.17		64.1		12.01		17.3		30.15		56.8		44.07		49.7	
		18		30		23		1		19		23		21		13
19.5	46.35		67.1		12.24		17.4		30.34		59.1		44.28		48.4	
		13		30		20		1		15		22		16		13
29.5	46.48		70.1		12.44		17.5		30.49		61.3		44.44		47.1	
		8		29		14		3		11		22		13		12
July 9.5	46.56		73.0		12.58		17.8		30.60		63.5		44.57		45.9	
		4		28		10		4		7		21		8		11
19.5	46.60		75.8		12.68		18.2		30.67		65.6		44.65		44.8	
		1		26		5		5		2		19		4		9
29.4	46.59		78.4		12.73		18.7		30.69		67.5		44.69		43.9	
		6		24		0		5		2		17		0		8
Aug. 8.4	46.53		80.8		12.73		19.2		30.67		69.2		44.69		43.1	
		10		21		5		5		6		14		5		7
18.4	46.43		82.9		12.68		19.7		30.61		70.6		44.64		42.4	
		14		18		10		6		10		12		8		4
28.4	46.29		84.7		12.58		20.3		30.51		71.8		44.56		42.0	
		18		15		13		5		13		10		11		4
Sept. 7.3	46.11		86.2		12.45		20.8		30.38		72.8		44.45		41.6	
		20		10		16		4		15		7		14		2
17.3	45.91		87.2		12.29		21.2		30.23		73.5		44.31		41.4	
		21		6		17		3		17		4		16		1
27.3	45.70		87.8		12.12		21.5		30.06		73.9		44.15		41.3	
		23		2		19		1		18		1		16		1
Oct. 7.2	45.47		88.0		11.93		21.6		29.88		74.0		43.99		41.4	
		22		2		18		1		18		2		16		1
17.2	45.25		87.8		11.75		21.7		29.70		73.8		43.83		41.5	
		21		7		17		1		16		5		15		3
27.2	45.04		87.1		11.58		21.6		29.54		73.3		43.68		41.8	
		19		11		14		3		14		8		12		4
Nov. 6.2	44.85		86.0		11.44		21.3		29.40		72.5		43.56		42.2	
		15		15		10		3		11		11		10		6
16.1	44.70		84.5		11.34		21.0		29.29		71.4		43.46		42.8	
		12		19		6		5		8		13		6		6
26.1	44.58		82.6		11.28		20.5		29.21		70.1		43.40		43.4	
		7		22		2		5		4		16		2		7
Dec. 6.1	44.51		80.4		11.26		20.0		29.17		68.5		43.38		44.1	
		3		25		3		6		0		17		2		9
16.1	44.48		77.9		11.29		19.4		29.17		66.8		43.40		45.0	
		2		27		9		6		4		19		6		9
26.0	44.50		75.2		11.38		18.8		29.21		64.9		43.46		45.9	
		7		28		13		6		9		20		10		9
36.0	44.57		72.4		11.51		18.2		29.30		62.9		43.56		46.8	
Sec δ, Tan δ	1.187		+0.639		1.155		−0.577		1.029		+0.244		1.004		−0.088	
Mean Place	43ˢ.567		75″.26		8ˢ.430		15″.07		27ˢ.427		65″.47		41ˢ.100		43″.97	
D′ψ α, Dω α	−0.02		−0.01		+0.01		+0.01		−0.01		0.00		0.00		0.00	
Dψ δ, Dω δ	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

Mean Solar Date.	α Coronæ Australis. Mag. 4.1 Right Ascension.		α Coronæ Australis. Declination S.		ι Lyræ. Mag. 5.1 Right Ascension.		ι Lyræ. Declination N.		π Sagittarii. Mag. 3.0 Right Ascension.		π Sagittarii. Declination S.		ψ Sagittarii. Mag. 4.9 Right Ascension.		ψ Sagittarii. Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 3		−38 2		19 4		+35 57		19 4		−21 9		19 10		−25 24	
	s		″		s		″		s		″		s		″	
Jan. 1.0	36.03	16	32.7	11	12.38	9	45.4	29	37.90	14	50.1	0	14.96	14	31.1	3
11.0	36.19	21	31.6	11	12.47	13	42.5	29	38.04	18	50.1	1	15.10	18	30.8	4
21.0	36.40	25	30.5	10	12.60	17	39.6	28	38.22	21	50.0	0	15.28	22	30.4	3
30.9	36.65	29	29.5	10	12.77	22	36.8	25	38.43	24	50.0	2	15.50	24	30.1	4
Feb. 9.9	36.94	31	28.5	10	12.99	25	34.3	22	38.67	27	49.8	2	15.74	27	29.7	5
19.9	37.25	34	27.5	9	13.24	28	32.1	18	38.94	28	49.6	2	16.01	29	29.2	4
Mar. 1.9	37.59	36	26.6	8	13.52	30	30.3	12	39.22	31	49.4	4	16.30	31	28.8	5
11.8	37.95	37	25.8	8	13.82	32	29.1	6	39.53	31	49.0	5	16.61	33	28.3	6
21.8	38.32	38	25.0	7	14.14	34	28.5	1	39.84	33	48.5	5	16.94	33	27.7	7
31.8	38.70	38	24.3	6	14.48	33	28.4	5	40.17	33	48.0	6	17.27	34	27.0	6
Apr. 10.7	39.08	39	23.7	5	14.81	34	28.9	10	40.50	33	47.4	7	17.61	34	26.4	7
20.7	39.47	38	23.2	3	15.15	32	29.9	16	40.83	32	46.7	8	17.95	34	25.7	7
30.7	39.85	37	22.9	2	15.47	31	31.5	20	41.15	32	45.9	7	18.29	33	25.0	7
May 10.7	40.22	35	22.7	1	15.78	29	33.5	24	41.47	30	45.2	7	18.62	32	24.3	6
20.6	40.57	33	22.6	1	16.07	26	35.9	27	41.77	28	44.5	7	18.94	29	23.7	5
30.6	40.90	29	22.7	3	16.33	23	38.6	29	42.05	26	43.8	6	19.23	27	23.2	4
June 9.6	41.19	26	23.0	5	16.56	18	41.5	31	42.31	22	43.2	5	19.50	23	22.8	3
19.6	41.45	21	23.5	5	16.74	14	44.6	31	42.53	19	42.7	4	19.73	20	22.5	1
29.5	41.66	17	24.0	8	16.88	9	47.7	30	42.72	14	42.3	2	19.93	15	22.4	1
July 9.5	41.83	11	24.8	8	16.97	4	50.7	30	42.86	10	42.1	2	20.08	11	22.3	1
19.5	41.94	6	25.6	9	17.01	1	53.7	28	42.96	6	41.9	0	20.19	6	22.4	2
29.4	42.00	0	26.5	9	17.00	6	56.5	25	43.02	0	41.9	0	20.25	1	22.6	3
Aug. 8.4	42.00	5	27.4	10	16.94	10	59.0	23	43.02	4	41.9	2	20.26	3	22.9	3
18.4	41.95	10	28.4	9	16.84	15	61.3	19	42.98	8	42.1	1	20.23	8	23.2	4
28.4	41.85	14	29.3	7	16.69	18	63.2	16	42.90	12	42.2	2	20.15	12	23.6	4
Sept. 7.3	41.71	18	30.0	7	16.51	21	64.8	12	42.78	14	42.4	3	20.03	14	24.0	3
17.3	41.53	19	30.7	5	16.30	23	66.0	8	42.64	16	42.7	2	19.89	17	24.3	3
27.3	41.34	21	31.2	2	16.07	24	66.8	3	42.48	17	42.9	1	19.72	17	24.6	2
Oct. 7.3	41.13	20	31.4	0	15.83	23	67.1	1	42.31	17	43.0	2	19.55	18	24.8	1
17.2	40.93	19	31.4	2	15.60	22	67.0	6	42.14	15	43.2	0	19.37	16	24.9	1
27.2	40.74	16	31.2	4	15.38	21	66.4	11	41.99	14	43.2	1	19.21	14	25.0	1
Nov. 6.2	40.58	12	30.8	6	15.17	17	65.3	15	41.85	10	43.3	1	19.07	11	24.9	1
16.1	40.46	8	30.2	8	15.00	14	63.8	18	41.75	6	43.2	0	18.96	6	24.8	2
26.1	40.38	3	29.4	9	14.86	9	62.0	23	41.69	2	43.2	1	18.90	3	24.6	3
Dec. 6.1	40.35	2	28.5	10	14.77	4	59.7	25	41.67	2	43.1	0	18.87	2	24.3	3
16.1	40.37	8	27.5	11	14.73	0	57.2	28	41.69	7	43.1	1	18.89	6	24.0	4
26.0	40.45	13	26.4	11	14.73	6	54.4	29	41.76	12	43.0	1	18.95	12	23.6	3
36.0	40.58		25.3		14.79		51.5		41.88		42.9		19.07		23.3	
Sec δ, Tan δ	1.270		−0.782		1.235		+0.726		1.072		−0.387		1.107		−0.475	
Mean Place	37ˢ.308		22″.49		13ˢ.996		52″.94		39ˢ.006		40″.27		16ˢ.088		21″.02	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.02		+0.01		−0.02		−0.01		+0.01		+0.01		+0.01		+0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis. Mag. 3.2				d Sagittarii. Mag. 5.0				θ Lyræ. Mag. 4.5				ω Aquilæ. Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 12		+67 30		19 12		−19 6		19 13		+37 58		19 13		+11 26	
	s		″		s		″		s		″		s		″	
Jan. 1.0	28.41		31.6		35.14		34.5		21.26		41.5		45.60		14.1	
11.0	28.39	2	28.1	35	35.27	13	34.5	0	21.34	8	38.5	30	45.70	10	12.2	19
21.0	28.48	9	24.6	35	35.44	17	34.6	1	21.46	12	35.5	30	45.84	14	10.4	18
30.9	28.68	20	21.3	33	35.64	20	34.6	0	21.62	16	32.6	29	46.02	18	8.7	17
Feb. 9.9	28.98	30	18.2	31	35.87	23	34.5	1	21.83	21	30.0	26	46.22	20	7.1	16
19.9	29.36	38	15.4	28	36.12	25	34.4	1	22.07	24	27.8	22	46.44	22	5.8	13
Mar. 1.9	29.83	47	13.1	23	36.40	28	34.1	3	22.35	28	26.0	18	46.70	26	4.8	10
11.8	30.36	53	11.4	17	36.69	29	33.8	3	22.65	30	24.6	14	46.97	27	4.2	6
21.8	30.93	57	10.3	11	37.00	31	33.3	5	22.97	32	23.9	7	47.25	28	4.0	2
31.8	31.53	60	9.8	5	37.32	32	32.7	6	23.31	34	23.7	2	47.54	29	4.2	2
Apr. 10.7	32.14	61	10.0	2	37.65	33	32.0	7	23.65	34	24.1	4	47.84	30	4.8	6
20.7	32.75	61	10.8	8	37.97	32	31.3	7	24.00	35	25.1	10	48.15	31	5.7	9
30.7	33.32	57	12.3	15	38.30	33	30.4	9	24.33	33	26.6	15	48.45	30	7.0	13
May 10.7	33.86	54	14.4	21	38.62	32	29.6	8	24.65	32	28.6	20	48.74	29	8.6	16
20.6	34.34	48	16.9	25	38.92	30	28.7	9	24.95	30	31.0	24	49.01	27	10.5	19
30.6	34.75	41	19.8	29	39.20	28	27.9	8	25.22	27	33.7	27	49.27	26	12.5	20
June 9.6	35.07	32	23.0	32	39.46	26	27.2	7	25.46	24	36.7	30	49.50	23	14.6	21
19.6	35.31	24	26.4	34	39.68	22	26.5	7	25.65	19	39.7	30	49.70	20	16.8	22
29.5	35.45	14	29.9	35	39.87	19	26.0	5	25.80	15	42.9	32	49.86	16	19.0	22
July 9.5	35.50	5	33.5	36	40.02	15	25.6	4	25.90	10	46.0	31	49.99	13	21.1	21
19.5	35.44	6	37.0	35	40.13	11	25.3	3	25.95	5	49.1	31	50.07	8	23.1	20
29.4	35.29	15	40.4	34	40.19	6	25.1	2	25.94	1	52.0	29	50.10	3	24.9	18
Aug. 8.4	35.04	25	43.6	32	40.20	1	25.1	0	25.89	5	54.7	27	50.10	0	26.6	17
18.4	34.70	34	46.5	29	40.17	3	25.1	0	25.79	10	57.1	24	50.05	5	28.0	14
28.4	34.29	41	49.0	25	40.09	8	25.2	1	25.64	15	59.2	21	49.96	9	29.2	12
Sept. 7.3	33.81	48	51.1	21	39.98	11	25.4	2	25.46	18	60.9	17	49.84	12	30.1	9
17.3	33.28	53	52.8	17	39.85	13	25.6	2	25.24	22	62.2	13	49.70	14	30.8	7
27.3	32.70	58	54.1	13	39.69	16	25.7	1	25.01	23	63.1	9	49.53	17	31.2	4
Oct. 7.3	32.11	59	54.8	7	39.52	17	25.9	2	24.77	24	63.5	4	49.36	17	31.4	2
17.2	31.51	60	54.9	1	39.36	16	26.1	2	24.52	25	63.5	0	49.19	17	31.2	2
27.2	30.92	59	54.5	4	39.20	16	26.2	1	24.29	23	63.0	5	49.03	16	30.8	4
Nov. 6.2	30.36	56	53.6	9	39.07	13	26.3	1	24.07	22	62.0	10	48.89	14	30.1	7
16.1	29.85	51	52.1	15	38.96	11	26.4	1	23.89	18	60.6	14	48.77	12	29.2	9
26.1	29.40	45	50.1	20	38.90	6	26.4	0	23.74	15	58.8	18	48.69	8	28.0	12
Dec. 6.1	29.02	38	47.7	24	38.87	3	26.4	0	23.63	11	56.6	22	48.64	5	26.6	14
16.1	28.74	28	44.8	29	38.89	2	26.5	1	23.57	6	54.1	25	48.64	0	25.0	16
26.0	28.55	19	41.7	31	38.95	6	26.5	0	23.56	1	51.3	28	48.67	3	23.3	17
36.0	28.47	8	38.3	34	39.05	10	26.6	1	23.60	4	48.4	29	48.75	8	21.4	19
Sec δ, Tan δ	2.614		+2.415		1.059		−0.346		1.269		+0.781		1.020		+0.202	
Mean Place	$32^{\mathrm{s}}.348$		$36''.87$		$36^{\mathrm{s}}.225$		$24''.58$		$22^{\mathrm{s}}.945$		$48''.23$		$46^{\mathrm{s}}.788$		$22''.40$	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.06		−0.05		+0.01		+0.01		−0.02		−0.02		−0.01		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−0.9		+0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	κ Cygni. Mag. 4.0				τ Draconis. Mag. 4.6				δ Aquilæ. Mag. 3.4				β Cygni. Mag. 3.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 15		+53 12		19 17		+73 11		19 21		+ 2 56		19 27		+27 46	
	s		″		s		″		s		″		s		″	
Jan. 1.0	4.59		28.0		7.60		41.6		8.63		24.4		13.74		35.6	
11.0	4.63	4	24.7	33	7.52	8	38.2	34	8.73	10	23.1	13	13.82	8	33.0	26
21.0	4.73	10	21.3	34	7.58	6	34.7	35	8.87	14	21.8	13	13.93	11	30.4	26
30.9	4.90	17	18.1	32	7.79	21	31.3	34	9.04	17	20.5	13	14.08	15	27.9	25
Feb. 9.9	5.13	23	15.1	30	8.13	34	28.2	31	9.24	20	19.4	11	14.27	19	25.7	22
19.9	5.41	28	12.5	26	8.60	47	25.4	28	9.47	23	18.5	9	14.49	22	23.7	20
Mar. 1.9	5.74	33	10.4	21	9.18	58	23.0	24	9.72	25	17.9	6	14.74	25	22.1	16
11.8	6.10	36	8.8	16	9.84	66	21.2	18	9.99	27	17.5	4	15.01	27	21.0	11
21.8	6.50	40	7.8	10	10.56	72	20.0	12	10.27	28	17.5	0	15.31	30	20.4	6
31.8	6.91	41	7.4	4	11.33	77	19.4	6	10.56	29	17.8	3	15.62	31	20.2	2
Apr. 10.8	7.33	42	7.7	3	12.11	78	19.5	1	10.86	30	18.4	6	15.93	31	20.7	5
20.7	7.75	42	8.6	9	12.88	77	20.3	8	11.17	31	19.4	10	16.25	32	21.6	9
30.7	8.16	41	10.1	15	13.62	74	21.7	14	11.47	30	20.6	12	16.57	32	23.0	14
May 10.7	8.55	39	12.2	21	14.30	68	23.6	19	11.76	29	22.0	14	16.88	31	24.8	18
20.6	8.90	35	14.7	25	14.91	61	26.0	24	12.05	29	23.6	16	17.17	29	27.0	22
30.6	9.21	31	17.6	29	15.42	51	28.8	28	12.31	26	25.4	18	17.44	27	29.4	24
June 9.6	9.47	26	20.7	31	15.82	40	32.0	32	12.55	24	27.2	18	17.68	24	32.1	27
19.6	9.68	21	24.1	34	16.11	29	35.4	34	12.76	21	29.0	18	17.89	21	34.9	28
29.5	9.82	14	27.6	35	16.27	16	38.9	35	12.94	18	30.8	18	18.05	16	37.8	29
July 9.5	9.91	9	31.0	34	16.30	3	42.4	35	13.07	13	32.5	17	18.18	13	40.6	28
19.5	9.92	1	34.4	34	16.19	11	46.0	36	13.17	10	34.0	15	18.25	7	43.4	28
29.5	9.88	4	37.7	33	15.96	23	49.4	34	13.22	5	35.5	15	18.28	3	46.0	26
Aug. 8.4	9.76	12	40.8	31	15.61	35	52.6	32	13.23	1	36.7	12	18.27	1	48.4	24
18.4	9.59	17	43.5	27	15.15	46	55.5	29	13.19	4	37.8	11	18.21	6	50.6	22
28.4	9.37	22	45.9	24	14.58	57	58.2	27	13.12	7	38.7	9	18.10	11	52.4	18
Sept. 7.3	9.10	27	48.0	21	13.93	65	60.4	22	13.02	10	39.3	6	17.96	14	54.0	16
17.3	8.79	31	49.6	16	13.21	72	62.2	18	12.88	14	39.8	5	17.79	17	55.2	12
27.3	8.45	34	50.7	11	12.43	78	63.5	13	12.73	15	40.1	3	17.60	19	56.0	8
Oct. 7.3	8.10	35	51.3	6	11.62	81	64.3	8	12.57	16	40.2	1	17.40	20	56.5	5
17.2	7.75	35	51.4	1	10.80	82	64.6	3	12.41	16	40.0	2	17.20	20	56.5	0
27.2	7.41	34	51.0	4	9.99	81	64.3	3	12.25	16	39.7	3	17.00	20	56.1	4
Nov. 6.2	7.09	32	50.0	10	9.21	78	63.5	8	12.12	13	39.2	5	16.82	18	55.4	7
16.2	6.80	29	48.5	15	8.49	72	62.2	13	12.01	11	38.5	7	16.66	16	54.2	12
26.1	6.56	24	46.6	19	7.85	64	60.3	19	11.93	8	37.6	9	16.54	12	52.7	15
Dec. 6.1	6.36	20	44.2	24	7.30	55	57.9	24	11.89	4	36.5	11	16.45	9	50.8	19
16.1	6.23	13	41.4	28	6.86	44	55.2	27	11.89	0	35.4	11	16.41	4	48.7	21
26.0	6.16	7	38.3	31	6.55	31	52.1	31	11.93	4	34.1	13	16.41	0	46.3	24
36.0	6.16	0	35.0	33	6.38	17	48.8	33	12.00	7	32.7	14	16.45	4	43.8	25
Sec δ, Tan δ	1.670		+1.337		3.459		+3.311		1.001		+0.051		1.130		+0.527	
Mean Place	6ˢ.966		33″.78		12ˢ.945		46″.16		9ˢ.744		33″.09		15ˢ.169		42″.07	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.03		−0.03		−0.08		−0.07		0.00		0.00		−0.01		−0.01	
$D'_\psi \delta$, $D_\omega \delta$	+0.1		−0.9		+0.1		−0.9		+0.1		−0.9		+0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Cygni. Mag. 3.9				μ Aquilæ. Mag. 4.6				h Sagittarii. Mag. 4.7				κ Aquilæ. Mag. 5.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 27		+51 32		19 29		+ 7 11		19 31		−25 4		19 32		− 7 13	
	s		″		s		″		s		″		s		″	
Jan. 1.0	30.01	3	41.4	33	52.18	9	36.5	16	27.42	12	38.0	4	14.90	10	18.9	8
11.0	30.04	8	38.1	33	52.27	13	34.9	16	27.54	16	37.6	4	15.00	13	19.7	7
21.0	30.12	15	34.8	32	52.40	16	33.3	15	27.70	19	37.2	5	15.13	17	20.4	6
31.0	30.27	21	31.6	30	52.56	19	31.8	13	27.89	22	36.7	5	15.30	20	21.0	5
Feb. 9.9	30.48	26	28.6	26	52.75	22	30.5	11	28.11	25	36.2	5	15.50	22	21.5	4
19.9	30.74	30	26.0	22	52.97	24	29.4	8	28.36	28	35.7	6	15.72	25	21.9	1
Mar. 1.9	31.04	35	23.8	17	53.21	26	28.6	5	28.64	29	35.1	7	15.97	27	22.0	0
11.8	31.39	37	22.1	11	53.47	28	28.1	1	28.93	32	34.4	7	16.24	28	22.0	3
21.8	31.76	40	21.0	5	53.75	29	28.0	2	29.25	32	33.7	8	16.52	30	21.7	5
31.8	32.16	41	20.5	2	54.04	30	28.2	6	29.57	34	32.9	9	16.82	30	21.2	7
Apr. 10.8	32.57	41	20.7	8	54.34	30	28.8	10	29.91	34	32.0	9	17.12	31	20.5	10
20.7	32.98	40	21.5	14	54.64	30	29.8	13	30.25	34	31.1	8	17.43	31	19.5	11
30.7	33.38	39	22.9	20	54.94	30	31.1	15	30.59	34	30.3	9	17.74	31	18.4	12
May 10.7	33.77	35	24.9	24	55.24	29	32.6	17	30.93	32	29.4	7	18.05	29	17.2	13
20.7	34.12	32	27.3	28	55.53	27	34.3	19	31.25	31	28.7	7	18.34	28	15.9	14
30.6	34.44	27	30.1	31	55.80	24	36.2	20	31.56	28	28.0	6	18.62	26	14.5	14
June 9.6	34.71	22	33.2	33	56.04	22	38.2	20	31.84	25	27.4	4	18.88	22	13.1	14
19.6	34.93	17	36.5	34	56.26	18	40.2	20	32.09	22	27.0	3	19.10	20	11.7	13
29.5	35.10	10	39.9	35	56.44	14	42.2	20	32.31	17	26.7	1	19.30	16	10.4	11
July 9.5	35.20	5	43.4	35	56.58	10	44.2	18	32.48	13	26.6	0	19.46	11	9.3	11
19.5	35.25	3	46.9	33	56.68	5	46.0	17	32.61	8	26.6	1	19.57	7	8.2	9
29.5	35.22	8	50.2	31	56.73	2	47.7	15	32.69	3	26.7	3	19.64	2	7.3	7
Aug. 8.4	35.14	15	53.3	28	56.75	3	49.2	12	32.72	1	27.0	3	19.66	2	6.6	6
18.4	34.99	20	56.1	25	56.72	7	50.4	11	32.71	6	27.3	4	19.64	6	6.0	4
28.4	34.79	24	58.6	22	56.65	11	51.5	9	32.65	11	27.7	5	19.58	9	5.6	3
Sept. 7.4	34.55	28	60.8	17	56.54	13	52.4	6	32.54	13	28.2	4	19.49	13	5.3	2
17.3	34.27	31	62.5	12	56.41	15	53.0	4	32.41	16	28.6	4	19.36	14	5.1	0
27.3	33.96	33	63.7	8	56.26	16	53.4	1	32.25	17	29.0	3	19.22	16	5.1	0
Oct. 7.3	33.63	34	64.5	2	56.10	17	53.5	1	32.08	17	29.3	2	19.06	16	5.1	2
17.2	33.29	32	64.7	2	55.93	16	53.4	3	31.91	16	29.5	1	18.90	15	5.3	3
27.2	32.97	31	64.5	8	55.77	14	53.1	6	31.75	15	29.6	1	18.75	13	5.6	3
Nov. 6.2	32.66	28	63.7	13	55.63	12	52.5	7	31.60	12	29.7	1	18.62	11	5.9	4
16.2	32.38	24	62.4	18	55.51	8	51.8	10	31.48	8	29.6	1	18.51	8	6.3	6
26.1	32.14	19	60.6	23	55.43	5	50.8	12	31.40	5	29.5	3	18.43	4	6.9	6
Dec. 6.1	31.95	14	58.3	26	55.38	2	49.6	14	31.35	0	29.2	3	18.39	1	7.5	6
16.1	31.81	8	55.7	30	55.36	3	48.2	15	31.35	5	28.9	3	18.38	4	8.1	7
26.1	31.73	1	52.7	32	55.39	6	46.7	15	31.40	9	28.6	4	18.42	7	8.8	7
36.0	31.72		49.5		55.45		45.2		31.49		28.2		18.49		9.5	
Sec δ, Tan δ	1.608		+1.259		1.008		+0.126		1.104		−0.468		1.008		−0.127	
Mean Place	$32^{s}.296$		$46''.11$		$53^{s}.320$		$44''.54$		$28^{s}.500$		$27''.50$		$15^{s}.951$		$9''.72$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.03		−0.03		0.00		0.00		+0.01		+0.01		0.00		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Cygni.** Mag. 4.6				**54 Sagittarii.** Mag. 5.4				**β Sagittæ.** Mag. 4.4				**15 Cygni.** Mag. 5.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 19 34		° ′ +50 0		h m 19 35		° ′ −16 29		h m 19 37		° ′ +17 16		h m 19 41		° ′ +37 8	
	s		″		s		″		s		″		s		″	
Jan. 1.0	5.94		73.0		46.81		38.5		9.92		27.1		8.88		41.4	
11.0	5.96	2	69.8	32	46.92	11	38.7	2	10.00	8	25.0	21	8.92	4	38.5	29
21.0	6.04	8	66.6	32	47.06	14	38.8	1	10.11	11	22.9	21	9.01	9	35.6	29
31.0	6.18	14	63.4	32	47.23	17	38.8	0	10.25	14	21.0	19	9.15	14	32.8	28
Feb. 9.9	6.37	19	60.4	30	47.44	21	38.8	0	10.43	18	19.2	18	9.32	17	30.2	26
19.9	6.62	25	57.8	26	47.67	23	38.7	1	10.64	21	17.6	16	9.54	22	27.9	23
Mar. 1.9	6.91	29	55.6	22	47.93	26	38.4	3	10.88	24	16.4	12	9.79	25	26.0	19
11.8	7.24	33	53.9	17	48.20	27	38.0	4	11.13	25	15.6	8	10.07	28	24.5	15
21.8	7.60	36	52.7	12	48.49	29	37.5	5	11.41	28	15.2	4	10.38	31	23.6	9
31.8	7.99	39	52.2	5	48.80	31	36.8	7	11.70	29	15.2	0	10.70	32	23.2	4
Apr. 10.8	8.39	40	52.4	2	49.12	32	36.0	8	12.00	30	15.7	5	11.04	34	23.4	2
20.7	8.79	40	53.1	7	49.44	32	35.1	9	12.31	31	16.6	9	11.38	34	24.2	8
30.7	9.18	39	54.5	14	49.76	32	34.0	11	12.62	31	17.9	13	11.73	35	25.6	14
May 10.7	9.56	38	56.4	19	50.08	32	33.0	10	12.92	30	19.6	17	12.06	33	27.4	18
20.7	9.91	35	58.7	23	50.39	31	31.9	11	13.21	29	21.6	20	12.38	32	29.6	22
30.6	10.23	32	61.5	28	50.69	30	30.8	11	13.48	27	23.8	22	12.67	29	32.2	26
June 9.6	10.51	28	64.6	31	50.96	27	29.8	10	13.73	25	26.1	23	12.93	26	35.1	29
19.6	10.74	23	67.9	33	51.20	24	28.9	9	13.95	22	28.5	24	13.15	22	38.1	30
29.5	10.91	17	71.3	34	51.41	21	28.2	7	14.13	18	31.0	25	13.33	18	41.3	32
July 9.5	11.03	12	74.7	34	51.58	17	27.5	7	14.27	14	33.5	25	13.47	14	44.4	31
19.5	11.08	5	78.2	35	51.70	12	27.0	5	14.37	10	35.8	23	13.55	8	47.6	32
29.5	11.08	0	81.5	33	51.78	8	26.6	4	14.42	5	38.0	22	13.58	3	50.6	30
Aug. 8.4	11.01	7	84.6	31	51.81	3	26.4	2	14.43	1	40.0	20	13.56	2	53.4	28
18.4	10.88	13	87.5	29	51.80	1	26.3	1	14.39	4	41.8	18	13.49	7	56.0	26
28.4	10.70	18	90.0	25	51.74	6	26.3	0	14.31	8	43.3	15	13.38	11	58.2	22
Sept. 7.4	10.47	23	92.2	22	51.65	9	26.4	1	14.20	11	44.6	13	13.22	16	60.2	20
17.3	10.20	27	94.0	18	51.53	12	26.5	1	14.06	14	45.6	10	13.03	19	61.7	15
27.3	9.91	29	95.3	13	51.38	15	26.7	2	13.90	16	46.2	6	12.81	22	62.9	12
Oct. 7.3	9.60	31	96.1	8	51.22	16	27.0	3	13.73	17	46.6	4	12.58	23	63.6	7
17.2	9.28	32	96.4	3	51.06	16	27.2	2	13.55	18	46.6	0	12.35	23	63.9	3
27.2	8.97	31	96.3	1	50.90	16	27.4	2	13.38	17	46.3	3	12.12	23	63.7	2
Nov. 6.2	8.67	30	95.5	8	50.76	14	27.6	2	13.22	16	45.7	6	11.90	22	63.0	7
16.2	8.40	27	94.3	12	50.65	11	27.8	2	13.08	14	44.8	9	11.70	20	61.9	11
26.1	8.17	23	92.6	17	50.57	8	28.0	2	12.98	10	43.5	13	11.54	16	60.4	15
Dec. 6.1	7.98	19	90.4	22	50.52	5	28.1	1	12.91	7	42.0	15	11.42	12	58.4	20
16.1	7.85	13	87.9	25	50.52	0	28.3	2	12.88	3	40.3	17	11.33	9	56.2	22
26.1	7.77	8	85.0	29	50.56	4	28.5	2	12.88	0	38.4	19	11.30	3	53.6	26
36.0	7.75	2	81.9	31	50.64	8	28.6	1	12.93	5	36.4	20	11.31	1	50.8	28
Sec δ, Tan δ	1.557		+1.193		1.043		−0.296		1.048		+0.311		1.255		+0.757	
Mean Place	$8^{s}.137$		77″.28		$47^{s}.850$		28″.60		$11^{s}.162$		34″.01		$10^{s}.541$		46″.18	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.03		−0.03		+0.01		+0.01		−0.01		−0.01		−0.02		−0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*f* Sagittarii. Mag. 5.1				γ Aquilæ. Mag. 2.8				δ Cygni. Mag. 3.0				δ Sagittæ. Mag. 3.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 19 41		° ′ −19 58		h m 19 42		° ′ +10 23		h m 19 42		° ′ +44 54		h m 19 43		° ′ +18 18	
	s		″		s		″		s		″		s		″	
Jan. 1.0	19.76		17.3		9.11		63.2		15.33		69.1		31.94		70.8	
11.0	19.86	10	17.2	1	9.19	8	61.5	17	15.35	2	66.1	30	32.01	7	68.7	21
21.0	20.00	14	17.1	1	9.30	11	59.8	17	15.42	7	62.9	32	32.11	10	66.6	21
31.0	20.17	17	16.9	2	9.44	14	58.2	16	15.55	13	59.9	30	32.25	14	64.6	20
Feb. 9.9	20.38	21	16.6	3	9.62	18	56.7	15	15.73	18	57.0	29	32.42	17	62.7	19
19.9	20.61	23	16.3	3	9.82	20	55.5	12	15.96	23	54.5	25	32.63	21	61.1	16
Mar. 1.9	20.87	26	15.9	4	10.06	24	54.6	9	16.23	27	52.4	21	32.86	23	59.9	12
11.9	21.15	28	15.3	6	10.31	25	54.0	6	16.53	30	50.7	17	33.11	25	59.0	9
21.8	21.44	29	14.7	6	10.58	27	53.7	3	16.86	33	49.6	11	33.39	28	58.5	5
31.8	21.75	31	13.9	8	10.87	29	53.9	2	17.21	35	49.1	5	33.68	29	58.5	0
Apr. 10.8	22.07	32	13.0	9	11.16	29	54.5	6	17.58	37	49.2	1	33.98	30	59.0	5
20.7	22.40	33	12.0	10	11.47	31	55.4	9	17.96	38	49.9	7	34.29	31	59.9	9
30.7	22.73	33	11.0	10	11.77	30	56.7	13	18.33	37	51.2	13	34.60	31	61.2	13
May 10.7	23.06	33	10.0	10	12.08	31	58.3	16	18.69	36	53.0	18	34.90	30	62.9	17
20.7	23.38	32	9.0	10	12.37	29	60.1	18	19.03	34	55.3	23	35.19	29	64.9	20
30.6	23.68	30	8.0	10	12.64	27	62.1	20	19.34	31	58.0	27	35.47	28	67.1	22
June 9.6	23.96	28	7.2	8	12.89	25	64.2	21	19.61	27	60.9	29	35.72	25	69.5	24
19.6	24.21	25	6.4	8	13.11	22	66.4	22	19.84	23	64.1	32	35.94	22	72.0	25
29.6	24.42	21	5.8	6	13.30	19	68.6	22	20.03	19	67.5	34	36.13	19	74.5	25
July 9.5	24.60	18	5.3	5	13.45	15	70.7	21	20.16	13	70.8	33	36.28	15	77.0	25
19.5	24.73	13	5.0	3	13.56	11	72.7	20	20.23	7	74.2	34	36.38	10	79.4	24
29.5	24.82	9	4.8	2	13.62	6	74.6	19	20.25	2	77.4	32	36.44	6	81.7	23
Aug. 8.4	24.86	4	4.8	0	13.64	2	76.3	17	20.21	4	80.5	31	36.45	1	83.7	20
18.4	24.85	1	4.9	1	13.62	2	77.8	15	20.11	10	83.3	28	36.42	3	85.6	19
28.4	24.80	5	5.0	1	13.56	6	79.1	13	19.97	14	85.8	25	36.35	7	87.2	16
Sept. 7.4	24.71	9	5.3	3	13.46	10	80.1	10	19.78	19	87.9	21	36.24	11	88.5	13
17.3	24.58	13	5.6	3	13.33	13	80.9	8	19.56	22	89.7	18	36.10	14	89.6	11
27.3	24.44	14	5.9	3	13.18	15	81.4	5	19.30	26	91.0	13	35.94	16	90.3	7
Oct. 7.3	24.28	16	6.2	3	13.02	16	81.6	2	19.03	27	91.8	8	35.77	17	90.7	4
17.3	24.11	17	6.4	2	12.85	17	81.6	0	18.75	28	92.2	4	35.59	18	90.8	1
27.2	23.95	16	6.6	2	12.69	16	81.3	3	18.48	27	92.1	1	35.41	18	90.5	3
Nov. 6.2	23.81	14	6.8	2	12.54	15	80.8	5	18.22	26	91.5	6	35.25	16	89.9	6
16.2	23.69	12	6.9	1	12.41	13	80.0	8	17.99	23	90.3	12	35.11	14	89.0	9
26.1	23.60	9	7.0	1	12.32	9	79.0	10	17.79	20	88.7	16	35.00	11	87.8	12
Dec. 6.1	23.55	5	7.0	0	12.25	7	77.7	13	17.62	17	86.7	20	34.93	7	86.3	15
16.1	23.54	1	7.0	0	12.22	3	76.3	14	17.50	12	84.3	24	34.89	4	84.6	17
26.1	23.57	3	6.9	1	12.24	2	74.7	16	17.44	6	81.5	28	34.89	0	82.7	19
36.0	23.65	8	6.9	0	12.29	5	73.1	16	17.43	1	78.6	29	34.93	4	80.7	20
Sec δ, Tan δ	1.064		−0.363		1.016		+0.184		1.412		+0.997		1.053		+0.331	
Mean Place	$20^{s}.791$		$7''.05$		$10^{s}.261$		$70''.55$		$17^{s}.269$		$73''.14$		$33^{s}.190$		$77''.29$	
$D'_{\psi}a$, $D_{\omega}a$	+0.01		+0.01		0.00		−0.01		−0.02		−0.03		−0.01		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Aquilæ. Mag. 0.9				η Aquilæ. Var. 3.7–4.4				ε Draconis. Mag. 4.0				ι Sagittarii. Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 19 46		° ′ + 8 38		h m 19 48		° ′ + 0 46		h m 19 48		° ′ +70 2		h m 19 49		° ′ −42 5	
	s		″		s		″		s		″		s		″	
Jan. 1.0	34.12		18.1		4.49		54.8		23.79		54.4		18.59		54.5	
11.0	34.19	7	16.5	16	4.57	8	53.7	11	23.66	13	51.1	33	18.70	11	53.0	15
21.0	34.30	11	14.9	16	4.68	11	52.5	12	23.65	1	47.7	34	18.86	16	51.5	15
31.0	34.44	14	13.4	15	4.83	15	51.5	10	23.76	11	44.3	34	19.06	20	50.0	15
Feb. 9.9	34.62	18	12.1	13	5.00	17	50.6	9	23.98	22	41.0	33	19.30	24	48.4	16
19.9	34.82	20	11.0	11	5.21	21	49.8	8	24.32	34	38.0	30	19.58	28	46.9	15
Mar. 1.9	35.05	23	10.1	9	5.44	23	49.3	5	24.76	44	35.4	26	19.89	31	45.4	15
11.9	35.30	25	9.6	5	5.69	25	49.1	2	25.28	52	33.3	21	20.23	34	44.0	14
21.8	35.57	27	9.4	2	5.96	27	49.2	1	25.87	59	31.8	15	20.59	36	42.6	14
31.8	35.86	29	9.6	2	6.24	28	49.6	4	26.51	64	30.9	9	20.98	39	41.4	12
Apr. 10.8	36.15	29	10.2	6	6.54	30	50.3	7	27.18	67	30.6	3	21.37	39	40.3	11
20.7	36.46	31	11.2	10	6.84	30	51.2	9	27.86	68	31.0	4	21.78	41	39.3	10
30.7	36.76	30	12.5	13	7.15	31	52.5	13	28.52	66	32.1	11	22.19	41	38.5	8
May 10.7	37.07	31	14.0	15	7.45	30	53.9	14	29.15	63	33.7	16	22.59	40	37.9	6
20.7	37.36	29	15.8	18	7.75	30	55.5	16	29.74	59	35.8	21	22.99	40	37.5	4
30.6	37.64	28	17.8	20	8.03	28	57.2	17	30.26	52	38.4	26	23.36	37	37.3	2
June 9.6	37.89	25	19.9	21	8.29	26	59.0	18	30.69	43	41.4	30	23.71	35	37.4	1
19.6	38.12	23	22.0	21	8.52	23	60.8	18	31.04	35	44.7	33	24.03	32	37.7	3
29.6	38.32	20	24.1	21	8.72	20	62.5	17	31.28	24	48.2	35	24.30	27	38.3	6
July 9.5	38.47	15	26.2	21	8.89	17	64.2	17	31.41	13	51.8	36	24.52	22	39.0	7
19.5	38.59	12	28.2	20	9.01	12	65.7	15	31.43	2	55.4	36	24.69	17	39.9	9
29.5	38.66	7	30.0	18	9.09	8	67.1	14	31.35	8	59.0	36	24.80	11	41.0	11
Aug. 8.4	38.69	3	31.6	16	9.12	3	68.3	12	31.15	20	62.5	35	24.85	5	42.2	12
18.4	38.67	2	33.0	14	9.11	1	69.4	11	30.85	30	65.7	32	24.84	1	43.4	12
28.4	38.61	6	34.2	12	9.06	5	70.2	8	30.46	39	68.6	29	24.78	6	44.7	13
Sept. 7.4	38.52	9	35.2	10	8.97	9	70.9	7	29.98	48	71.2	26	24.67	11	45.8	11
17.3	38.40	12	36.0	8	8.85	12	71.3	4	29.43	55	73.4	22	24.51	16	46.8	10
27.3	38.25	15	36.5	5	8.71	14	71.6	3	28.83	60	75.2	18	24.33	18	47.7	9
Oct. 7.3	38.09	16	36.7	2	8.56	15	71.7	1	28.19	64	76.5	13	24.12	21	48.3	6
17.3	37.93	16	36.7	0	8.40	16	71.6	1	27.52	67	77.2	7	23.90	22	48.7	4
27.2	37.77	16	36.4	3	8.25	15	71.3	3	26.85	67	77.5	3	23.69	21	48.9	2
Nov. 6.2	37.62	15	35.9	5	8.11	14	70.9	4	26.20	65	77.1	4	23.49	20	48.7	2
16.2	37.50	12	35.2	7	7.99	12	70.3	6	25.58	62	76.2	9	23.32	17	48.2	5
26.1	37.40	10	34.3	9	7.90	9	69.5	8	25.02	56	74.7	15	23.19	13	47.5	7
Dec. 6.1	37.34	6	33.1	12	7.84	6	68.7	8	24.53	49	72.7	20	23.11	8	46.6	9
16.1	37.31	3	31.8	13	7.82	2	67.7	10	24.12	41	70.3	24	23.08	3	45.5	11
26.1	37.32	1	30.3	15	7.83	1	66.6	11	23.81	31	67.4	29	23.10	2	44.2	13
36.0	37.37	5	28.8	15	7.89	6	65.4	12	23.61	20	64.3	31	23.17	7	42.7	15
Sec δ, Tan δ	1.012		+0.152		1.000		+0.014		2.931		+2.755		1.348		−0.904	
Mean Place	35ˢ.243		25″.47		5ˢ.549		63″.03		28ˢ.314		55″.91		19ˢ.782		42″.46	
$D'_\psi\alpha$, $D_\omega\alpha$	0.00		0.00		0.00		0.00		−0.06		−0.08		+0.02		+0.03	
$D_\psi\delta$, $D_\omega\delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ε Pavonis.** Mag. 4.1				**β Aquilæ.** Mag. 3.9				**γ Sagittæ.** Mag. 3.7				**c Sagittarii.** Mag. 4.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 50		−73 8		19 51		+ 6 11		19 54		+19 15		19 57		−27 56	
	s		″		s		″		s		″		s		″	
Jan. 1.0	36.69	13	32.5	31	4.24	7	21.0	15	54.68	5	22.6	21	21.31	9	70.3	6
11.0	36.82	27	29.4	31	4.31	10	19.5	14	54.73	9	20.5	21	21.40	13	69.7	7
21.0	37.09	40	26.3	30	4.41	14	18.1	14	54.82	13	18.4	20	21.53	17	69.0	7
31.0	37.49	51	23.3	29	4.55	17	16.7	12	54.95	16	16.4	19	21.70	20	68.3	8
Feb. 9.9	38.00	62	20.4	28	4.72	20	15.5	10	55.11	20	14.5	16	21.90	23	67.5	9
19.9	38.62	71	17.6	25	4.92	23	14.5	8	55.31	22	12.9	14	22.13	26	66.6	9
Mar. 1.9	39.33	79	15.1	23	5.15	25	13.7	5	55.53	25	11.5	9	22.39	28	65.7	10
11.9	40.12	84	12.8	19	5.40	26	13.2	1	55.78	27	10.6	5	22.67	31	64.7	10
21.8	40.96	90	10.9	15	5.66	28	13.1	3	56.05	28	10.1	0	22.98	32	63.7	11
31.8	41.86	93	9.4	12	5.94	30	13.4	6	56.33	30	10.1	4	23.30	34	62.6	11
Apr. 10.8	42.79	94	8.2	8	6.24	30	14.0	9	56.63	31	10.5	8	23.64	34	61.5	11
20.7	43.73	94	7.4	4	6.54	31	14.9	13	56.94	32	11.3	13	23.98	35	60.4	10
30.7	44.67	92	7.0	1	6.85	30	16.2	15	57.26	30	12.6	17	24.33	35	59.4	10
May 10.7	45.59	88	7.1	5	7.15	30	17.7	17	57.56	30	14.3	19	24.68	35	58.4	8
20.7	46.47	84	7.6	9	7.45	28	19.4	19	57.86	29	16.2	22	25.03	33	57.6	8
30.6	47.31	76	8.5	13	7.73	26	21.3	19	58.15	26	18.4	24	25.36	30	56.8	6
June 9.6	48.07	66	9.8	16	7.99	23	23.2	20	58.41	23	20.8	26	25.66	28	56.2	5
19.6	48.73	56	11.4	20	8.22	20	25.2	20	58.64	19	23.4	25	25.94	24	55.7	2
29.6	49.29	45	13.4	22	8.42	16	27.2	20	58.83	16	25.9	26	26.18	21	55.5	1
July 9.5	49.74	31	15.6	24	8.58	12	29.2	18	58.99	11	28.5	25	26.39	15	55.4	1
19.5	50.05	17	18.0	26	8.70	7	31.0	17	59.10	7	31.0	24	26.54	11	55.5	2
29.5	50.22	3	20.6	25	8.77	3	32.7	15	59.17	2	33.4	21	26.65	6	55.7	4
Aug. 8.4	50.25	12	23.1	25	8.80	1	34.2	13	59.19	2	35.5	20	26.71	0	56.1	5
18.4	50.13	24	25.6	23	8.79	5	35.5	11	59.17	6	37.5	17	26.71	4	56.6	6
28.4	49.89	37	27.9	21	8.74	9	36.6	9	59.11	10	39.2	14	26.67	8	57.2	6
Sept. 7.4	49.52	47	30.0	17	8.65	12	37.5	6	59.01	13	40.6	12	26.59	12	57.8	6
17.3	49.05	56	31.7	14	8.53	14	38.1	4	58.88	16	41.8	8	26.47	15	58.4	6
27.3	48.49	62	33.1	9	8.39	15	38.5	2	58.72	17	42.6	5	26.32	17	59.0	5
Oct. 7.3	47.87	64	34.0	4	8.24	16	38.7	1	58.55	18	43.1	1	26.15	17	59.5	4
17.3	47.23	64	34.4	2	8.08	16	38.6	2	58.37	18	43.2	1	25.98	17	59.9	2
27.2	46.59	61	34.2	7	7.92	15	38.4	5	58.19	16	43.1	6	25.81	16	60.1	1
Nov. 6.2	45.98	55	33.5	12	7.77	12	37.9	7	58.03	14	42.5	8	25.65	13	60.2	0
16.2	45.43	46	32.3	17	7.65	10	37.2	9	57.89	12	41.7	12	25.52	11	60.2	2
26.1	44.97	36	30.6	21	7.55	6	36.3	11	57.77	8	40.5	14	25.41	6	60.0	3
Dec. 6.1	44.61	23	28.5	25	7.49	3	35.2	12	57.69	5	39.1	17	25.35	3	59.7	4
16.1	44.38	9	26.0	28	7.46	1	34.0	14	57.64	1	37.4	19	25.32	2	59.3	5
26.1	44.29	4	23.2	30	7.47	5	32.6	14	57.63	2	35.5	20	25.34	6	58.8	6
36.0	44.33		20.2		7.52		31.2		57.65		33.5		25.40		58.2	
Sec δ, Tan δ	3.448		−3.299		1.006		+0.108		1.060		+0.349		1.132		−0.531	
Mean Place	$39^{s}.748$		$19''.27$		$5^{s}.335$		$28''.49$		$55^{s}.929$		$28''.45$		$22^{s}.328$		$59''.17$	
$D'_{\psi}a$, $D_{\omega}a$	+0.08		+0.10		0.00		0.00		−0.01		−0.01		+0.01		+0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Aquilæ. Mag. 5.6				θ Aquilæ. Mag. 3.4				o Cygni *seq.* Mag. 4.0				κ Cephei. Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 59		+ 7 1		20 6		− 1 4		20 10		+46 28		20 11		+77 26	
	s		″		s		″		s		″		s		″	
Jan. 1.1	55.25	6	58.1	15	51.07	6	46.1	10	53.47	2	46.7	29	41.15	37	71.7	31
11.0	55.31	10	56.6	14	51.13	10	47.1	10	53.45	4	43.8	31	40.78	19	68.6	33
21.0	55.41	13	55.2	14	51.23	13	48.1	9	53.49	9	40.7	31	40.59	0	65.3	33
31.0	55.54	16	53.8	12	51.36	16	49.0	7	53.58	14	37.6	29	40.59	20	62.0	33
Feb. 10.0	55.70	19	52.6	11	51.52	19	49.7	6	53.72	19	34.7	27	40.79	38	58.7	31
19.9	55.89	22	51.5	8	51.71	21	50.3	4	53.91	24	32.0	23	41.17	56	55.6	28
Mar. 1.9	56.11	24	50.7	4	51.92	24	50.7	1	54.15	28	29.7	18	41.73	70	52.8	23
11.9	56.35	27	50.3	1	52.16	26	50.8	2	54.43	32	27.9	14	42.43	83	50.5	19
21.8	56.62	28	50.2	2	52.42	28	50.6	5	54.75	34	26.5	8	43.26	93	48.6	12
31.8	56.90	29	50.4	6	52.70	29	50.1	7	55.09	37	25.7	2	44.19	99	47.4	6
Apr. 10.8	57.19	30	51.0	9	52.99	31	49.4	10	55.46	38	25.5	5	45.18	101	46.8	0
20.8	57.49	31	51.9	13	53.30	31	48.4	12	55.84	39	26.0	10	46.19	101	46.8	6
30.7	57.80	30	53.2	15	53.61	31	47.2	15	56.23	38	27.0	16	47.20	98	47.4	12
May 10.7	58.10	30	54.7	18	53.92	30	45.7	16	56.61	36	28.6	21	48.18	91	48.6	19
20.7	58.40	29	56.5	19	54.22	29	44.1	17	56.97	34	30.7	25	49.09	81	50.5	23
30.7	58.69	26	58.4	20	54.51	27	42.4	18	57.31	31	33.2	28	49.90	69	52.8	27
June 9.6	58.95	24	60.4	21	54.78	25	40.6	17	57.62	27	36.0	32	50.59	56	55.5	31
19.6	59.19	20	62.5	21	55.03	22	38.9	17	57.89	22	39.2	33	51.15	40	58.6	34
29.6	59.39	17	64.6	20	55.25	18	37.2	16	58.11	17	42.5	34	51.55	24	62.0	35
July 9.5	59.56	13	66.6	19	55.43	14	35.6	15	58.28	11	45.9	34	51.79	7	65.5	36
19.5	59.69	8	68.5	18	55.57	10	34.1	14	58.39	5	49.3	34	51.86	10	69.1	36
29.5	59.77	4	70.3	15	55.67	5	32.7	12	58.44	0	52.7	32	51.76	26	72.7	36
Aug. 8.5	59.81	0	71.8	14	55.72	1	31.5	9	58.44	6	55.9	30	51.50	43	76.3	34
18.4	59.81	5	73.2	12	55.73	4	30.6	8	58.38	12	58.9	28	51.07	57	79.7	32
28.4	59.76	8	74.4	10	55.69	7	29.8	6	58.26	16	61.7	25	50.50	71	82.9	29
Sept. 7.4	59.68	11	75.4	7	55.62	11	29.2	4	58.10	21	64.2	20	49.79	83	85.8	26
17.4	59.57	14	76.1	5	55.51	13	28.8	3	57.89	24	66.2	17	48.96	93	88.4	21
27.3	59.43	15	76.6	2	55.38	14	28.5	1	57.65	26	67.9	12	48.03	100	90.5	17
Oct. 7.3	59.28	16	76.8	0	55.24	16	28.4	1	57.39	28	69.1	8	47.03	106	92.2	12
17.3	59.12	16	76.8	2	55.08	15	28.5	3	57.11	28	69.9	2	45.97	108	93.4	7
27.2	58.96	15	76.6	4	54.93	14	28.8	4	56.83	27	70.1	3	44.89	107	94.1	1
Nov. 6.2	58.81	13	76.2	7	54.79	12	29.2	5	56.56	25	69.8	7	43.82	104	94.2	5
16.2	58.68	10	75.5	9	54.67	10	29.7	6	56.31	23	69.1	13	42.78	99	93.7	10
26.2	58.58	7	74.6	11	54.57	7	30.3	8	56.08	19	67.8	18	41.79	90	92.7	16
Dec. 6.1	58.51	3	73.5	12	54.50	3	31.1	9	55.89	15	66.0	21	40.89	78	91.1	21
16.1	58.48	0	72.3	13	54.47	0	32.0	9	55.74	10	63.9	26	40.11	64	89.0	25
26.1	58.48	3	71.0	14	54.47	4	32.9	10	55.64	5	61.3	28	39.47	48	86.5	29
36.1	58.51		69.6		54.51		33.9		55.59		58.5		38.99		83.6	
Sec δ, Tan δ	1.008		+0.123		1.000		−0.019		1.452		+1.053		4.603		+4.493	
Mean Place	$56^{\mathrm{s}}.343$		$65''.21$		$52^{\mathrm{s}}.083$		$38''.13$		$55^{\mathrm{s}}.461$		$48''.17$		$48^{\mathrm{s}}.429$		$70''.40$	
$D'_{\psi}\,\alpha$, $D_{\omega}\,\alpha$	0.00		0.00		0.00		0.00		−0.02		−0.04		−0.10		−0.16	
$D_{\psi}\,\delta$, $D_{\omega}\,\delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	24 Vulpeculæ. Mag. 5.4				α^2 Capricorni. Mag. 3.8				β Capricorni. Mag. 3.2				α Pavonis. Mag. 2.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 20 13		° ′ +24 24		h m 20 13		° ′ −12 48		h m 20 16		° ′ −15 3		h m 20 18		° ′ −57 0	
	s		″		s		″		s		″		s		″	
Jan. 1.1	5.00	3	15.9	22	16.10	7	53.0	3	9.94	7	22.9	2	49.65	6	55.9	22
11.0	5.03	6	13.7	23	16.17	10	53.3	3	10.01	10	23.1	0	49.71	13	53.7	25
21.0	5.09	11	11.4	23	16.27	13	53.6	1	10.11	13	23.1	0	49.84	19	51.2	24
31.0	5.20	14	9.1	21	16.40	17	53.7	1	10.24	16	23.1	1	50.03	26	48.8	25
Feb. 10.0	5.34	18	7.0	19	16.57	19	53.8	1	10.40	19	23.0	2	50.29	31	46.3	24
19.9	5.52	21	5.1	15	16.76	22	53.7	3	10.59	22	22.8	4	50.60	36	43.9	24
Mar. 1.9	5.73	23	3.6	12	16.98	25	53.4	4	10.81	25	22.4	5	50.96	41	41.5	22
11.9	5.96	26	2.4	7	17.23	26	53.0	6	11.06	27	21.9	7	51.37	44	39.3	20
21.8	6.22	29	1.7	3	17.49	29	52.4	8	11.33	28	21.2	9	51.81	48	37.3	18
31.8	6.51	30	1.4	3	17.78	30	51.6	10	11.61	30	20.3	10	52.29	50	35.5	16
Apr. 10.8	6.81	32	1.7	7	18.08	31	50.6	11	11.91	32	19.3	12	52.79	53	33.9	13
20.8	7.13	32	2.4	12	18.39	32	49.5	13	12.23	32	18.1	12	53.32	53	32.6	10
30.7	7.45	32	3.6	16	18.71	32	48.2	13	12.55	33	16.9	13	53.85	53	31.6	6
May 10.7	7.77	31	5.2	20	19.03	32	46.9	14	12.88	32	15.6	14	54.38	52	31.0	4
20.7	8.08	29	7.2	22	19.35	30	45.5	13	13.20	31	14.2	13	54.90	50	30.6	1
30.7	8.37	28	9.4	25	19.65	29	44.2	14	13.51	29	12.9	13	55.40	48	30.7	4
June 9.6	8.65	25	11.9	27	19.94	27	42.8	12	13.80	27	11.6	12	55.88	43	31.1	7
19.6	8.90	21	14.6	28	20.21	23	41.6	12	14.07	24	10.4	10	56.31	37	31.8	10
29.6	9.11	17	17.4	28	20.44	20	40.4	10	14.31	20	9.4	9	56.68	32	32.8	14
July 9.5	9.28	13	20.2	27	20.64	15	39.4	8	14.51	16	8.5	7	57.00	25	34.2	16
19.5	9.41	8	22.9	27	20.79	11	38.6	7	14.67	12	7.8	6	57.25	18	35.8	18
29.5	9.49	4	25.6	24	20.90	7	37.9	5	14.79	7	7.2	4	57.43	9	37.6	19
Aug. 8.5	9.53	2	28.0	23	20.97	2	37.4	4	14.86	2	6.8	2	57.52	2	39.5	19
18.4	9.51	5	30.3	20	20.99	3	37.0	2	14.88	2	6.6	1	57.54	6	41.4	20
28.4	9.46	10	32.3	17	20.96	6	36.8	0	14.86	7	6.5	1	57.48	13	43.4	18
Sept. 7.4	9.36	12	34.0	15	20.90	10	36.8	0	14.79	9	6.6	2	57.35	20	45.2	17
17.4	9.24	16	35.5	11	20.80	13	36.8	2	14.70	13	6.8	2	57.15	24	46.9	14
27.3	9.08	18	36.6	7	20.67	14	37.0	2	14.57	14	7.0	3	56.91	29	48.3	11
Oct. 7.3	8.90	18	37.3	4	20.53	15	37.2	3	14.43	15	7.3	3	56.62	31	49.4	7
17.3	8.72	18	37.7	1	20.38	15	37.5	3	14.28	16	7.6	3	56.31	31	50.1	4
27.2	8.54	18	37.6	3	20.23	15	37.8	3	14.12	14	7.9	3	56.00	30	50.5	1
Nov. 6.2	8.36	16	37.3	8	20.08	12	38.1	3	13.98	13	8.2	3	55.70	27	50.4	6
16.2	8.20	13	36.5	11	19.96	10	38.4	4	13.85	10	8.5	3	55.43	23	49.8	9
26.2	8.07	11	35.4	14	19.86	7	38.8	3	13.75	7	8.8	3	55.20	18	48.9	14
Dec. 6.1	7.96	7	34.0	18	19.79	4	39.1	3	13.68	4	9.1	2	55.02	12	47.5	16
16.1	7.89	3	32.2	19	19.75	1	39.4	4	13.64	0	9.3	2	54.90	5	45.9	20
26.1	7.86	0	30.3	22	19.76	4	39.8	3	13.64	4	9.5	2	54.85	1	43.9	22
36.1	7.86		28.1		19.80		40.1		13.68		9.7		54.86		41.7	
Sec δ, Tan δ	1.098		+0.454		1.026		−0.228		1.035		−0.269		1.837		−1.541	
Mean Place	$6^s.306$		20″.03		$17^s.055$		43″.62		$10^s.880$		13″.20		$51^s.046$		41″.86	
$D'_\psi\,\alpha$, $D_\omega\,\alpha$	−0.01		−0.02		+0.01		+0.01		+0.01		+0.01		+0.03		+0.06	
$D_\psi\,\delta$, $D_\omega\,\delta$	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cygni. Mag. 2.3				π Capricorni. Mag. 5.2				ρ Capricorni. Mag. 5.0				41 Cygni. Mag. 4.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 20 19		° ′ +39 58		h m 20 22		° ′ −18 29		h m 20 23		° ′ −18 5		h m 20 25		° ′ +30 4	
	s		″		s		″		s		″		s		″	
Jan. 1.1	6.78	1	49.5	27	23.09	6	49.5	1	56.51	6	65.4	0	51.54	0	49.2	24
11.0	6.77	4	46.8	28	23.15	9	49.4	1	56.57	9	65.4	2	51.54	5	46.8	25
21.0	6.81	9	44.0	29	23.24	13	49.3	3	56.66	12	65.2	2	51.59	9	44.3	24
31.0	6.90	13	41.1	27	23.37	16	49.0	3	56.78	16	65.0	3	51.68	12	41.9	24
Feb. 10.0	7.03	17	38.4	25	23.53	19	48.7	5	56.94	19	64.7	4	51.80	17	39.5	21
19.9	7.20	22	35.9	22	23.72	22	48.2	6	57.13	22	64.3	6	51.97	20	37.4	18
Mar. 1.9	7.42	25	33.7	17	23.94	25	47.6	7	57.35	24	63.7	7	52.17	23	35.6	14
11.9	7.67	29	32.0	12	24.19	27	46.9	9	57.59	27	63.0	9	52.40	26	34.2	10
21.9	7.96	32	30.8	7	24.46	29	46.0	10	57.86	28	62.1	10	52.66	29	33.2	5
31.8	8.28	34	30.1	1	24.75	30	45.0	11	58.14	31	61.1	11	52.95	31	32.7	1
Apr. 10.8	8.62	35	30.0	4	25.05	32	43.9	12	58.45	32	60.0	12	53.26	32	32.8	6
20.8	8.97	36	30.4	10	25.37	33	42.7	13	58.77	32	58.8	13	53.58	33	33.4	11
30.7	9.33	35	31.4	16	25.70	33	41.4	13	59.09	33	57.5	13	53.91	33	34.5	15
May 10.7	9.68	35	33.0	20	26.03	33	40.1	13	59.42	33	56.2	14	54.24	33	36.0	20
20.7	10.03	33	35.0	24	26.36	32	38.8	12	59.75	32	54.8	12	54.57	31	38.0	23
30.7	10.36	30	37.4	28	26.68	30	37.6	12	60.07	30	53.6	12	54.88	29	40.3	26
June 9.6	10.66	26	40.2	30	26.98	27	36.4	10	60.37	28	52.4	11	55.17	26	42.9	28
19.6	10.92	22	43.2	32	27.25	25	35.4	10	60.65	25	51.3	9	55.43	22	45.7	29
29.6	11.14	18	46.4	32	27.50	21	34.4	7	60.90	21	50.4	8	55.65	19	48.6	30
July 9.6	11.32	13	49.6	33	27.71	17	33.7	5	61.11	17	49.6	6	55.84	14	51.6	30
19.5	11.45	7	52.9	32	27.88	13	33.2	4	61.28	12	49.0	4	55.98	9	54.6	29
29.5	11.52	2	56.1	31	28.01	8	32.8	2	61.40	8	48.6	2	56.07	4	57.5	27
Aug. 8.5	11.54	3	59.2	29	28.09	2	32.6	0	61.48	3	48.4	0	56.11	1	60.2	26
18.4	11.51	8	62.1	26	28.11	1	32.6	1	61.51	1	48.4	1	56.10	5	62.8	23
28.4	11.43	13	64.7	24	28.10	6	32.7	2	61.50	6	48.5	2	56.05	10	65.1	20
Sept. 7.4	11.30	17	67.1	19	28.04	10	32.9	3	61.44	9	48.7	3	55.95	13	67.1	17
17.4	11.13	20	69.0	16	27.94	12	33.2	4	61.35	12	49.0	3	55.82	16	68.8	14
27.3	10.93	22	70.6	12	27.82	14	33.6	4	61.23	15	49.3	4	55.66	18	70.2	9
Oct. 7.3	10.71	24	71.8	7	27.68	16	34.0	4	61.08	15	49.7	4	55.48	19	71.1	6
17.3	10.47	24	72.5	3	27.52	15	34.4	3	60.93	16	50.1	3	55.29	20	71.7	2
27.3	10.23	23	72.8	2	27.37	15	34.7	3	60.77	14	50.4	4	55.09	19	71.9	2
Nov. 6.2	10.00	21	72.6	8	27.22	13	35.0	3	60.63	13	50.8	2	54.90	18	71.7	7
16.2	9.79	20	71.8	11	27.09	11	35.3	2	60.50	11	51.0	2	54.72	15	71.0	11
26.2	9.59	16	70.7	16	26.98	8	35.5	1	60.39	8	51.2	2	54.57	13	69.9	14
Dec. 6.1	9.43	12	69.1	21	26.90	4	35.6	1	60.31	4	51.4	1	54.44	9	68.5	18
16.1	9.31	9	67.0	23	26.86	0	35.7	0	60.27	1	51.5	0	54.35	6	66.7	20
26.1	9.22	3	64.7	26	26.86	3	35.7	0	60.26	3	51.5	0	54.29	2	64.7	23
36.1	9.19		62.1		26.89		35.7		60.29		51.5		54.27		62.4	
Sec δ, Tan δ	1.305		+0.839		1.054		−0.335		1.052		−0.327		1.156		+0.579	
Mean Place	8ˢ.490		51″.15		24ˢ.005		39″.30		57ˢ.416		55″.31		52ˢ.943		51″.73	
D′ψ a, Dω a	−0.02		−0.03		+0.01		+0.01		+0.01		+0.01		−0.01		−0.02	
Dψ δ, Dω δ	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Cephei.** Mag. 4.3				**ε Delphini.** Mag. 4.0				**Groombridge 3241.** Mag. 6.4				**α Indi.** Mag. 3.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 28		+62 41		20 29		+11 0		20 30		+72 14		20 31		−47 35	
	s		″		s		″		s		″		s		″	
Jan. 1.1	5.27	14	78.9	30	5.21	3	31.6	15	18.21	28	28.3	30	30.20	5	46.1	18
11.0	5.13	5	75.9	32	5.24	6	30.1	16	17.93	15	25.3	32	30.25	10	44.3	19
21.0	5.08	3	72.7	33	5.30	10	28.5	15	17.78	2	22.1	34	30.35	15	42.4	20
31.0	5.11	12	69.4	33	5.40	13	27.0	14	17.76	11	18.7	33	30.50	20	40.4	21
Feb. 10.0	5.23	20	66.1	30	5.53	17	25.6	12	17.87	25	15.4	31	30.70	25	38.3	21
19.9	5.43	28	63.1	28	5.70	19	24.4	10	18.12	37	12.3	29	30.95	28	36.2	20
Mar. 1.9	5.71	35	60.3	23	5.89	22	23.4	6	18.49	48	9.4	25	31.23	32	34.2	21
11.9	6.06	41	58.0	19	6.11	24	22.8	3	18.97	58	6.9	20	31.55	36	32.1	19
21.9	6.47	47	56.1	12	6.35	27	22.5	1	19.55	65	4.9	14	31.91	38	30.2	18
31.8	6.94	50	54.9	6	6.62	28	22.6	5	20.20	71	3.5	8	32.29	41	28.4	16
Apr. 10.8	7.44	52	54.3	0	6.90	30	23.1	9	20.91	75	2.7	2	32.70	42	26.8	15
20.8	7.96	53	54.3	6	7.20	31	24.0	12	21.66	75	2.5	5	33.12	44	25.3	13
30.7	8.49	53	54.9	13	7.51	31	25.2	16	22.41	74	3.0	11	33.56	44	24.0	10
May 10.7	9.02	50	56.2	18	7.82	31	26.8	18	23.15	70	4.1	17	34.00	44	23.0	7
20.7	9.52	47	58.0	23	8.13	30	28.6	20	23.85	65	5.8	22	34.44	43	22.3	4
30.7	9.99	42	60.3	28	8.43	28	30.6	21	24.50	57	8.0	27	34.87	41	21.9	1
June 9.6	10.41	36	63.1	31	8.71	25	32.7	23	25.07	48	10.7	30	35.28	37	21.8	2
19.6	10.77	29	66.2	34	8.96	23	35.0	23	25.55	37	13.7	33	35.65	34	22.0	5
29.6	11.06	22	69.6	36	9.19	19	37.3	22	25.92	27	17.0	35	35.99	28	22.5	8
July 9.6	11.28	13	73.2	36	9.38	15	39.5	22	26.19	15	20.5	37	36.27	24	23.3	10
19.5	11.41	5	76.8	37	9.53	11	41.7	21	26.34	2	24.2	37	36.51	17	24.3	13
29.5	11.46	3	80.5	36	9.64	7	43.8	18	26.36	10	27.9	37	36.68	10	25.6	14
Aug. 8.5	11.43	12	84.1	34	9.71	2	45.6	17	26.26	21	31.6	35	36.78	4	27.0	16
18.4	11.31	19	87.5	32	9.73	3	47.3	15	26.05	33	35.1	33	36.82	2	28.6	16
28.4	11.12	26	90.7	30	9.70	6	48.8	12	25.72	43	38.4	31	36.80	8	30.2	15
Sept. 7.4	10.86	32	93.7	26	9.64	10	50.0	10	25.29	52	41.5	28	36.72	14	31.7	15
17.4	10.54	38	96.3	22	9.54	12	51.0	7	24.77	60	44.3	23	36.58	18	33.2	13
27.3	10.16	42	98.5	17	9.42	14	51.7	4	24.17	66	46.6	19	36.40	21	34.5	11
Oct. 7.3	9.74	44	100.2	12	9.28	16	52.1	2	23.51	71	48.5	14	36.19	23	35.6	8
17.3	9.30	46	101.4	7	9.12	16	52.3	1	22.80	72	49.9	9	35.96	24	36.4	5
27.3	8.84	45	102.1	2	8.96	15	52.2	3	22.08	74	50.8	3	35.72	23	36.9	1
Nov. 6.2	8.39	44	102.3	4	8.81	13	51.9	6	21.34	71	51.1	2	35.49	21	37.0	2
16.2	7.95	41	101.9	10	8.68	12	51.3	8	20.63	68	50.9	8	35.28	18	36.8	6
26.2	7.54	37	100.9	15	8.56	9	50.5	10	19.95	63	50.1	14	35.10	14	36.2	9
Dec. 6.1	7.17	32	99.4	20	8.47	6	49.5	13	19.32	55	48.7	19	34.96	9	35.3	12
16.1	6.85	25	97.4	25	8.41	3	48.2	14	18.77	45	46.8	24	34.87	5	34.1	14
26.1	6.60	19	94.9	29	8.38	1	46.8	15	18.32	35	44.4	28	34.82	2	32.7	17
36.1	6.41		92.0		8.39		45.3		17.97		41.6		34.84		31.0	
Sec δ, Tan δ	2.181		+1.938		1.019		+0.195		3.278		+3.122		1.483		−1.095	
Mean Place	8^{s}.481		77″.07		6^{s}.278		37″.04		23^{s}.240		25″.36		31^{s}.271		32″.34	
D′ψ α, Dω α	−0.04		−0.08		0.00		−0.01		−0.07		−0.13		+0.02		+0.04	
Dψ δ, Dω δ	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*β* Delphini. Mag. 3.7				*υ* Capricorni. Mag. 5.3				*α* Delphini. Mag. 3.9				*β* Pavonis. Mag. 3.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 20 33		° ′ +14 17		h m 20 35		° ′ −18 26		h m 20 35		° ′ +15 36		h m 20 37		° ′ −66 30	
	s		″		s		″		s		″		s		″	
Jan. 1.1	29.91		38.5		8.48		41.2		37.51		25.4		11.63		63.4	
11.1	29.93	2	36.8	17	8.53	5	41.2	0	37.53	2	23.7	17	11.63	0	60.7	27
21.0	29.99	6	35.1	17	8.61	8	41.0	2	37.59	6	21.9	18	11.73	10	57.8	29
31.0	30.08	9	33.4	17	8.72	11	40.7	3	37.68	9	20.1	18	11.92	19	54.8	30
Feb. 10.0	30.21	13	31.9	15	8.87	15	40.3	4	37.80	12	18.5	16	12.19	27	51.8	30
19.9	30.37	16	30.5	14	9.05	18	39.8	5	37.95	15	17.1	14	12.55	36	48.9	29
Mar. 1.9	30.55	18	29.4	11	9.25	20	39.2	6	38.14	19	15.9	12	12.98	43	46.1	28
11.9	30.77	22	28.6	8	9.49	24	38.4	8	38.35	21	15.1	8	13.48	50	43.4	27
21.9	31.01	24	28.2	4	9.75	26	37.5	9	38.59	24	14.6	5	14.03	55	40.9	25
31.8	31.28	27	28.2	0	10.03	28	36.4	11	38.86	27	14.6	0	14.63	60	38.8	21
Apr. 10.8	31.56	28	28.6	4	10.33	30	35.2	12	39.14	28	14.9	3	15.27	64	36.9	19
20.8	31.86	30	29.4	8	10.64	31	33.9	13	39.45	31	15.7	8	15.94	67	35.4	15
30.8	32.17	31	30.6	12	10.97	33	32.6	13	39.76	31	16.9	12	16.63	69	34.2	12
May 10.7	32.49	32	32.1	15	11.30	33	31.2	14	40.07	31	18.4	15	17.33	70	33.5	7
20.7	32.80	31	33.9	18	11.63	33	29.8	14	40.38	31	20.2	18	18.02	69	33.1	4
30.7	33.10	30	36.0	21	11.95	32	28.5	13	40.68	30	22.3	21	18.68	66	33.2	1
June 9.6	33.38	28	38.3	23	12.26	31	27.2	13	40.97	29	24.6	23	19.31	63	33.7	5
19.6	33.64	26	40.7	24	12.55	29	26.1	11	41.23	26	27.0	24	19.89	58	34.6	9
29.6	33.87	23	43.1	24	12.81	26	25.1	10	41.46	23	29.5	25	20.40	51	35.9	13
July 9.6	34.07	20	45.5	24	13.03	22	24.3	8	41.66	20	31.9	24	20.83	43	37.5	16
19.5	34.22	15	47.8	23	13.21	18	23.7	6	41.81	15	34.3	24	21.18	35	39.4	19
29.5	34.33	11	50.0	22	13.35	14	23.3	4	41.92	11	36.6	23	21.43	25	41.5	21
Aug. 8.5	34.40	7	52.1	21	13.43	8	23.1	2	41.99	7	38.8	22	21.57	14	43.8	23
18.5	34.42	2	53.9	18	13.47	4	23.1	0	42.01	2	40.7	19	21.61	4	46.2	24
28.4	34.40	2	55.6	17	13.47	0	23.2	1	41.99	2	42.4	17	21.54	7	48.5	23
Sept. 7.4	34.34	6	57.0	14	13.42	5	23.4	2	41.93	6	43.9	15	21.38	16	50.8	23
17.4	34.24	10	58.1	11	13.34	8	23.7	3	41.83	10	45.1	12	21.12	26	52.8	20
27.3	34.11	13	58.9	8	13.22	12	24.1	4	41.71	12	46.0	9	20.79	33	54.5	17
Oct. 7.3	33.97	14	59.5	6	13.08	14	24.5	4	41.56	15	46.6	6	20.40	39	55.9	14
17.3	33.81	16	59.8	3	12.93	15	25.0	5	41.40	16	47.0	4	19.97	43	56.9	10
27.3	33.65	16	59.8	0	12.78	15	25.4	4	41.24	16	47.0	0	19.52	45	57.4	5
Nov. 6.2	33.49	16	59.5	3	12.63	15	25.7	3	41.08	16	46.7	3	19.08	44	57.4	0
16.2	33.35	14	58.9	6	12.49	14	26.0	3	40.94	14	46.1	6	18.66	42	56.8	6
26.2	33.23	12	58.1	8	12.38	11	26.2	2	40.82	12	45.3	8	18.29	37	55.8	10
Dec. 6.2	33.13	10	57.0	11	12.30	8	26.4	2	40.72	10	44.1	12	17.97	32	54.3	15
16.1	33.07	6	55.6	14	12.25	5	26.5	1	40.65	7	42.8	13	17.74	23	52.4	19
26.1	33.03	4	54.1	15	12.24	1	26.5	0	40.61	4	41.3	15	17.59	15	50.1	23
36.1	33.03	0	52.5	16	12.26	2	26.5	0	40.61	0	39.6	17	17.53	6	47.5	26
Sec δ, Tan δ	1.032		+0.255		1.054		−0.333		1.038		+0.279		2.509		−2.301	
Mean Place	31ˢ.012		43″.20		9ˢ.351		31″.12		38ˢ.627		29″.77		13ˢ.353		48″.01	
D′ψ α, Dω α	−0.01		−0.01		+0.01		+0.01		−0.01		−0.01		+0.05		+0.10	
Dψ δ, Dω δ	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* **Cygni.** Mag. 1.3				*δ* **Delphini.** Mag. 4.5				*ψ* **Capricorni.** Mag. 4.3				*γ* **Delphini** *seq.* Mag. 4.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 20 38		° ′ +44 58		h m 20 39		° ′ +14 45		h m 20 40		° ′ −25 34		h m 20 42		° ′ +15 48	
	s		″		s		″		s		″		s		″	
Jan. 1.1	28.12		21.7		25.55		50.9		59.53		60.9		39.00		45.6	
11.1	28.07	5	19.0	27	25.57	2	49.2	17	59.57	4	60.4	5	39.01	1	43.9	17
21.0	28.08	1	16.1	29	25.62	5	47.5	17	59.65	8	59.7	7	39.06	5	42.1	18
31.0	28.13	5	13.1	30	25.70	8	45.8	17	59.77	12	59.0	7	39.14	8	40.4	17
Feb. 10.0	28.24	11	10.3	28	25.82	12	44.2	16	59.92	15	58.2	8	39.26	12	38.7	17
19.9	28.39	15	7.6	27	25.97	15	42.8	14	60.10	18	57.2	10	39.41	15	37.3	14
Mar. 1.9	28.59	20	5.2	24	26.16	19	41.7	11	60.31	21	56.2	10	39.59	18	36.1	12
11.9	28.84	25	3.2	20	26.37	21	40.9	8	60.55	24	55.0	12	39.79	20	35.2	9
21.9	29.13	29	1.7	15	26.61	24	40.4	5	60.81	26	53.8	12	40.03	24	34.7	5
31.8	29.45	32	0.7	10	26.87	26	40.4	0	61.10	29	52.4	14	40.29	26	34.6	1
Apr. 10.8	29.80	35	0.4	3	27.15	28	40.8	4	61.41	31	51.1	13	40.57	28	35.0	4
20.8	30.17	37	0.6	2	27.45	30	41.5	7	61.74	33	49.7	14	40.87	30	35.8	8
30.8	30.55	38	1.4	8	27.76	31	42.7	12	62.08	34	48.3	14	41.18	31	36.9	11
May 10.7	30.93	38	2.7	13	28.07	31	44.2	15	62.43	35	46.9	14	41.49	31	38.4	15
20.7	31.30	37	4.6	19	28.38	31	46.1	19	62.78	35	45.6	13	41.81	32	40.2	18
30.7	31.66	36	6.9	23	28.69	31	48.1	20	63.12	34	44.4	12	42.11	30	42.3	21
June 9.6	31.99	33	9.6	27	28.98	29	50.4	23	63.44	32	43.4	10	42.40	29	44.6	23
19.6	32.29	30	12.6	30	29.24	26	52.8	24	63.74	30	42.6	8	42.67	27	47.0	24
29.6	32.54	25	15.8	32	29.47	23	55.2	24	64.02	28	42.0	6	42.91	24	49.5	25
July 9.6	32.74	20	19.1	33	29.67	20	57.6	24	64.26	24	41.5	5	43.11	20	51.9	24
19.5	32.89	15	22.6	35	29.83	16	60.0	24	64.45	19	41.3	2	43.27	16	54.4	25
29.5	32.98	9	26.0	34	29.95	12	62.3	23	64.60	15	41.3	0	43.39	12	56.7	23
Aug. 8.5	33.02	4	29.3	33	30.02	7	64.4	21	64.70	10	41.5	2	43.46	7	58.8	21
18.5	33.00	2	32.4	31	30.05	3	66.3	19	64.75	5	41.9	4	43.49	3	60.8	20
28.4	32.93	7	35.3	29	30.03	2	68.0	17	64.75	0	42.4	5	43.48	1	62.5	17
Sept. 7.4	32.80	13	37.9	26	29.97	6	69.4	14	64.70	5	43.0	6	43.42	6	64.0	15
17.4	32.64	16	40.2	23	29.88	9	70.6	12	64.62	8	43.6	6	43.33	9	65.3	13
27.3	32.43	21	42.1	19	29.76	12	71.5	9	64.50	12	44.3	7	43.21	12	66.2	9
Oct. 7.3	32.20	23	43.6	15	29.61	15	72.1	6	64.36	14	44.9	6	43.06	15	66.8	6
17.3	31.95	25	44.7	11	29.46	15	72.4	3	64.20	16	45.5	6	42.91	15	67.2	4
27.3	31.69	26	45.2	5	29.30	16	72.4	0	64.04	16	46.0	5	42.75	16	67.3	1
Nov. 6.2	31.43	26	45.2	0	29.14	16	72.1	3	63.88	16	46.4	4	42.59	16	67.0	3
16.2	31.18	25	44.8	4	29.00	14	71.6	5	63.73	15	46.6	2	42.44	15	66.5	5
26.2	30.96	22	43.8	10	28.87	13	70.8	8	63.61	12	46.7	1	42.32	12	65.7	8
Dec. 6.2	30.76	20	42.4	14	28.77	10	69.7	11	63.52	9	46.6	1	42.22	10	64.6	11
16.1	30.60	16	40.5	19	28.70	7	68.4	13	63.46	6	46.4	2	42.14	8	63.3	13
26.1	30.48	12	38.2	23	28.66	4	66.9	15	63.44	2	46.1	3	42.10	4	61.7	16
36.1	30.40	8	35.7	25	28.66	0	65.2	17	63.45	1	45.7	4	42.09	1	60.1	16
Sec δ, Tan δ	1.413		+0.999		1.034		+0.264		1.109		−0.479		1.039		+0.283	
Mean Place	29ˢ.985		21″.04		26ˢ.642		55″.18		60ˢ.382		49″.62		40ˢ.098		49″.57	
D′ψ a, Dω a	−0.02		−0.04		−0.01		−0.01		+0.01		+0.02		−0.01		−0.01	
Dψ δ, Dω δ	+0.3		−0.8		+0.3		−0.8		+0.3		−0.8		+0.3		−0.8	

Mean Solar Date.	ε Cygni. Mag. 2.6				ε Aquarii. Mag. 3.8				η Cephei. Mag. 3.6				μ Aquarii. Mag. 4.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 20 42		° ′ +33 38		h m 20 43		° ′ − 9 48		h m 20 43		° ′ +61 29		h m 20 43		° ′ − 9 18	
	s		″		s		″		s		″		s		″	
Jan. 1.1	42.43		50.5		0.44		49.0		29.53		79.4		0.14		32.8	
11.1	42.41	2	48.1	24	0.47	3	49.4	4	29.38	15	76.5	29	0.17	3	33.2	4
21.0	42.44	3	45.6	25	0.54	7	49.7	3	29.31	7	73.4	31	0.23	6	33.6	4
31.0	42.50	6	43.0	26	0.64	10	50.0	3	29.32	1	70.2	32	0.33	10	33.8	2
Feb. 10.0	42.61	11	40.6	24	0.77	13	50.1	1	29.40	8	67.0	32	0.45	12	34.0	2
19.9	42.76	15	38.3	23	0.94	17	50.1	0	29.57	17	64.0	30	0.61	16	34.0	0
Mar. 1.9	42.94	18	36.3	20	1.13	19	49.9	2	29.81	24	61.2	28	0.80	19	33.8	2
11.9	43.16	22	34.7	16	1.34	21	49.5	4	30.13	32	58.8	24	1.01	21	33.4	4
21.9	43.42	26	33.6	11	1.58	24	48.9	6	30.51	38	56.8	20	1.25	24	32.8	6
31.8	43.70	28	32.9	7	1.85	27	48.1	8	30.94	43	55.5	13	1.51	26	32.0	8
Apr. 10.8	44.01	31	32.8	1	2.14	29	47.0	11	31.42	48	54.7	8	1.79	28	31.0	10
20.8	44.34	33	33.2	4	2.44	30	45.8	12	31.92	50	54.6	1	2.09	30	29.7	13
30.8	44.68	34	34.1	9	2.75	31	44.5	13	32.44	52	55.1	5	2.40	31	28.3	14
May 10.7	45.02	34	35.6	15	3.07	32	43.0	15	32.95	51	56.2	11	2.72	32	26.8	15
20.7	45.36	34	37.4	18	3.39	32	41.4	16	33.45	50	57.9	17	3.04	32	25.3	15
30.7	45.69	33	39.7	23	3.70	31	39.8	16	33.92	47	60.2	23	3.35	31	23.6	17
June 9.6	46.00	31	42.3	26	4.00	30	38.2	16	34.35	43	62.8	26	3.65	30	22.0	16
19.6	46.28	28	45.1	28	4.28	28	36.7	15	34.73	38	65.9	31	3.93	28	20.5	15
29.6	46.52	24	48.1	30	4.53	25	35.3	14	35.04	31	69.2	33	4.19	26	19.0	15
July 9.6	46.72	20	51.2	31	4.75	22	34.0	13	35.28	24	72.7	35	4.41	22	17.7	13
19.5	46.88	16	54.3	31	4.93	18	32.9	11	35.45	17	76.4	37	4.60	19	16.5	12
29.5	46.99	11	57.4	31	5.07	14	32.0	9	35.54	9	80.1	37	4.74	14	15.6	9
Aug. 8.5	47.05	6	60.4	30	5.16	9	31.2	8	35.54	0	83.8	37	4.83	9	14.8	8
18.5	47.05	0	63.2	28	5.20	4	30.7	5	35.47	7	87.3	35	4.88	5	14.2	6
28.4	47.01	4	65.7	25	5.20	0	30.3	4	35.32	15	90.6	33	4.89	1	13.7	5
Sept. 7.4	46.93	8	68.0	23	5.16	4	30.1	2	35.10	22	93.7	31	4.85	4	13.5	2
17.4	46.81	12	69.9	19	5.09	7	30.0	1	34.82	28	96.5	28	4.78	7	13.4	1
27.3	46.65	16	71.5	16	4.98	11	30.1	1	34.48	34	98.9	24	4.68	10	13.5	1
Oct. 7.3	46.47	18	72.8	13	4.85	13	30.3	2	34.11	37	100.8	19	4.55	13	13.6	1
17.3	46.27	20	73.6	8	4.71	14	30.5	2	33.70	41	102.3	15	4.41	14	13.9	3
27.3	46.07	20	74.0	4	4.56	15	30.9	4	33.27	43	103.2	9	4.26	15	14.2	3
Nov. 6.2	45.87	20	73.9	1	4.42	14	31.2	3	32.85	42	103.6	4	4.12	14	14.6	4
16.2	45.68	19	73.5	4	4.29	13	31.7	5	32.43	42	103.4	2	3.99	13	15.0	4
26.2	45.51	17	72.6	9	4.18	11	32.1	4	32.03	40	102.6	8	3.88	11	15.5	5
Dec. 6.2	45.37	14	71.2	14	4.10	8	32.5	4	31.67	36	101.3	13	3.79	9	15.9	4
16.1	45.25	12	69.5	17	4.04	6	33.0	5	31.36	31	99.5	18	3.74	5	16.4	5
26.1	45.17	8	67.5	20	4.02	2	33.4	4	31.10	26	97.2	23	3.71	3	16.9	5
36.1	45.13	4	65.2	23	4.03	1	33.9	5	30.91	19	94.5	27	3.72	1	17.3	4
Sec δ, Tan δ	1.202		+0.666		1.015		−0.173		2.096		+1.842		1.013		−0.164	
Mean Place	$43^{s}.887$		$51''.29$		$1^{s}.306$		$40''.35$		$32^{s}.553$		$76''.20$		$0^{s}.993$		$24''.32$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		−0.03		0.00		+0.01		−0.04		−0.08		0.00		+0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.8		+0.3		−0.8		+0.3		−0.8		+0.3		−0.7	

Mean Solar Date.	**β Indi.** Mag. 3.7				**32 Vulpeculæ.** Mag. 5.2				**220 Draconis** (Heis). Mag. 5.6				**ν Cygni.** Mag. 4.0		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decl tion
	h m 20 48		° ′ −58 46		h m 20 50		° ′ +27 43		h m 20 51		° ′ +80 13		h m 20 53		° +40
	s		″		s		″		s		″		s		″
Jan. 1.1	4.61		60.6		52.38		46.8		22.47		55.2		56.33		69.1
11.1	4.62	1	58.2	24	52.37	1	44.6	22	21.78	69	52.4	28	56.28	5	66.5
21.0	4.69	7	55.7	25	52.39	2	42.4	22	21.30	48	49.4	30	56.27	1	63.8
31.0	4.83	14	53.1	26	52.45	6	40.1	23	21.06	24	46.2	32	56.32	5	61.1
Feb. 10.0	5.04	21	50.4	27	52.55	10	37.9	22	21.07	1	42.9	33	56.41	9	58.4
20.0	5.31	27	47.7	27	52.69	14	35.9	20	21.33	26	39.7	32	56.54	13	55.8
Mar. 1.9	5.63	32	45.0	27	52.86	17	34.1	18	21.82	49	36.7	30	56.72	18	53.5
11.9	6.01	38	42.5	25	53.07	21	32.7	14	22.53	71	34.0	27	56.94	22	51.6
21.9	6.43	42	40.1	24	53.31	24	31.7	10	23.43	90	31.7	23	57.20	26	50.1
31.8	6.89	46	37.9	22	53.58	27	31.2	5	24.48	105	30.0	17	57.50	30	49.2
Apr. 10.8	7.39	50	35.9	20	53.87	29	31.2	0	25.66	118	28.8	12	57.82	32	48.8
20.8	7.91	52	34.2	17	54.18	31	31.7	5	26.91	125	28.3	5	58.17	35	48.9
30.8	8.45	54	32.8	14	54.51	33	32.6	9	28.19	128	28.4	1	58.53	36	49.6
May 10.7	9.00	55	31.8	10	54.84	33	34.0	14	29.47	128	29.1	7	58.90	37	50.9
20.7	9.55	55	31.1	7	55.17	33	35.9	19	30.69	122	30.4	13	59.26	36	52.7
30.7	10.09	54	30.8	3	55.49	32	38.1	22	31.82	113	32.2	18	59.61	35	54.9
June 9.7	10.60	51	30.9	1	55.79	30	40.5	24	32.84	102	34.6	24	59.94	33	57.5
19.6	11.08	48	31.4	5	56.07	28	43.2	27	33.70	86	37.3	27	60.24	30	60.3
29.6	11.51	43	32.3	9	56.32	25	46.1	29	34.39	69	40.4	31	60.50	26	63.4
July 9.6	11.88	37	33.5	12	56.53	21	49.0	29	34.88	49	43.8	34	60.72	22	66.7
19.5	12.18	30	35.0	15	56.69	16	51.9	29	35.17	29	47.4	36	60.89	17	70.0
29.5	12.41	23	36.8	18	56.81	12	54.7	28	35.25	8	51.1	37	61.01	12	73.3
Aug. 8.5	12.56	15	38.7	19	56.88	7	57.5	28	35.12	13	54.8	37	61.07	6	76.5
18.5	12.62	6	40.7	20	56.91	3	60.0	25	34.78	34	58.4	36	61.08	1	79.6
28.4	12.60	2	42.8	21	56.89	2	62.3	23	34.24	54	61.9	35	61.04	4	82.5
Sept. 7.4	12.50	10	44.9	21	56.82	7	64.4	21	33.52	72	65.2	33	60.95	9	85.1
17.4	12.34	16	46.8	19	56.72	10	66.2	18	32.63	89	68.2	30	60.81	14	87.3
27.4	12.11	23	48.5	17	56.58	14	67.6	14	31.59	104	70.9	27	60.64	17	89.3
Oct. 7.3	11.83	28	49.9	14	56.42	16	68.7	11	30.42	117	73.2	23	60.44	20	90.8
17.3	11.52	31	51.0	11	56.25	17	69.5	8	29.16	126	75.1	19	60.22	22	91.9
27.3	11.19	33	51.6	6	56.07	18	69.8	3	27.83	133	76.4	13	60.00	22	92.5
Nov. 6.2	10.87	32	51.8	2	55.89	18	69.8	0	26.47	136	77.2	8	59.77	23	92.7
16.2	10.56	31	51.6	2	55.72	17	69.3	5	25.11	136	77.4	2	59.54	23	92.4
26.2	10.29	27	50.8	8	55.56	16	68.5	8	23.78	133	77.0	4	59.34	20	91.6
Dec. 6.2	10.06	23	49.7	11	55.43	13	67.3	12	22.53	125	76.1	9	59.16	18	90.3
16.1	9.89	17	48.2	15	55.33	10	65.7	16	21.39	114	74.5	16	59.01	15	88.6
26.1	9.78	11	46.3	19	55.26	7	63.9	18	20.39	100	72.5	20	58.90	11	86.6
36.1	9.74	4	44.1	22	55.22	4	61.9	20	19.57	82	70.0	25	58.82	8	84.2
Sec δ, Tan δ	1.929		−1.650		1.130		+0.526		5.894		+5.808		1.322		+0.86
Mean Place	$5^{s}.844$		$45''.24$		$53^{s}.669$		$48''.08$		$31^{s}.610$		$49''.51$		$57^{s}.983$		$67''.82$
$D'_{\psi}\,\alpha$, $D_{\omega}\,\alpha$	+0.03		+0.07		−0.01		−0.02		−0.11		−0.26		−0.02		−0.04
$D_{\psi}\,\delta$, $D_{\omega}\,\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**α Octantis.** Mag. 5.2				**γ Microscopii.** Mag. 4.7				**θ Capricorni.** Mag. 4.2				**ξ Cygni.** Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 54		−77 20		20 56		−32 35		21 1		−17 34		21 1		+43 34	
	s		″		s		″		s		″		s		″	
Jan. 1.1	17.41		88.2		0.40		52.8		6.11		40.9		46.40		66.1	
11.1	17.26	15	85.1	31	0.43	3	51.8	10	6.13	2	40.8	1	46.33	7	63.6	25
21.0	17.28	2	81.9	32	0.49	6	50.8	10	6.18	5	40.7	1	46.31	2	60.8	28
31.0	17.47	19	78.5	34	0.59	10	49.6	12	6.27	9	40.4	3	46.34	3	58.0	28
Feb. 10.0	17.82	35	75.0	35	0.73	14	48.3	13	6.38	11	40.0	4	46.41	7	55.2	28
20.0	18.33	51	71.6	34	0.91	18	46.8	15	6.53	15	39.5	5	46.53	12	52.6	26
Mar. 1.9	18.98	65	68.4	32	1.11	20	45.3	15	6.71	18	38.8	7	46.71	18	50.2	24
11.9	19.76	78	65.3	31	1.35	24	43.8	15	6.92	21	37.9	9	46.93	22	48.1	21
21.9	20.65	89	62.5	28	1.62	27	42.1	17	7.16	24	36.9	10	47.19	26	46.5	16
31.8	21.64	99	60.0	25	1.92	30	40.5	16	7.42	26	35.7	12	47.49	30	45.4	11
Apr. 10.8	22.71	107	57.9	21	2.24	32	38.8	17	7.71	29	34.4	13	47.82	33	44.9	5
20.8	23.84	113	56.2	17	2.58	34	37.2	16	8.01	30	33.0	14	48.17	35	44.9	0
30.8	25.01	117	54.9	13	2.94	36	35.7	15	8.33	32	31.5	15	48.54	37	45.5	6
May 10.7	26.19	118	54.1	8	3.30	36	34.3	14	8.66	33	30.0	15	48.92	38	46.7	12
20.7	27.37	118	53.8	3	3.67	37	33.0	13	8.99	33	28.4	16	49.30	38	48.4	17
30.7	28.51	114	53.9	1	4.04	37	31.9	11	9.32	33	26.9	15	49.66	36	50.5	21
June 9.7	29.60	109	54.5	6	4.39	35	31.0	9	9.64	32	25.5	14	50.01	35	53.1	26
19.6	30.60	100	55.6	11	4.72	33	30.3	7	9.94	30	24.2	13	50.32	31	56.0	29
29.6	31.49	89	57.1	15	5.02	30	29.9	4	10.21	27	23.1	11	50.60	28	59.1	31
July 9.6	32.26	77	58.9	18	5.28	26	29.8	1	10.45	24	22.1	10	50.83	23	62.3	32
19.5	32.87	61	61.1	22	5.50	22	29.9	1	10.66	21	21.4	7	51.01	18	65.7	34
29.5	33.31	44	63.6	25	5.68	18	30.2	3	10.82	16	20.8	6	51.14	13	69.1	34
Aug. 8.5	33.57	26	66.2	26	5.80	12	30.8	6	10.93	11	20.5	3	51.21	7	72.4	33
18.5	33.64	7	69.0	28	5.86	6	31.5	7	11.00	7	20.4	1	51.22	1	75.6	32
28.4	33.53	11	71.7	27	5.88	2	32.4	9	11.02	2	20.4	0	51.18	4	78.6	30
Sept. 7.4	33.24	29	74.3	26	5.84	4	33.4	10	10.99	3	20.6	2	51.10	8	81.3	27
17.4	32.78	46	76.6	23	5.76	8	34.4	10	10.93	6	20.9	3	50.96	14	83.8	25
27.4	32.18	60	78.7	21	5.65	11	35.4	10	10.83	10	21.3	4	50.79	17	85.9	21
Oct. 7.3	31.45	73	80.4	17	5.50	15	36.3	9	10.71	12	21.8	5	50.58	21	87.5	16
17.3	30.63	82	81.6	12	5.33	17	37.1	8	10.57	14	22.3	5	50.36	22	88.8	13
27.3	29.77	86	82.2	6	5.16	17	37.7	6	10.42	15	22.8	5	50.12	24	89.5	7
Nov. 6.2	28.89	88	82.3	1	4.99	17	38.1	4	10.28	14	23.2	4	49.88	24	89.8	3
16.2	28.03	86	81.8	5	4.83	16	38.4	3	10.14	14	23.6	4	49.64	24	89.6	2
26.2	27.24	79	80.7	11	4.68	15	38.4	0	10.02	12	23.9	3	49.42	22	89.0	6
Dec. 6.2	26.54	70	79.0	17	4.57	11	38.2	2	9.93	9	24.2	3	49.22	20	87.8	12
16.1	25.97	57	76.9	21	4.49	8	37.7	5	9.86	7	24.4	2	49.05	17	86.1	17
26.1	25.54	43	74.3	26	4.45	4	37.1	6	9.82	4	24.5	1	48.92	13	84.1	20
36.1	25.27	27	71.4	29	4.45	0	36.3	8	9.82	0	24.5	0	48.83	9	81.8	23
Sec δ, Tan δ	4.567		−4.457		1.187		−0.640		1.049		−0.317		1.380		+0.952	
Mean Place	$20^{\mathrm{s}}.274$		$71''.77$		$1^{\mathrm{s}}.200$		$40''.34$		$6^{\mathrm{s}}.876$		$31''.09$		$48^{\mathrm{s}}.130$		$63''.78$	
$D'_\psi a$, $D_\omega a$	+0.09		+0.20		+0.01		+0.03		+0.01		+0.02		−0.02		−0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**61 Cygni *pr.*** Mag. 5.6				**ν Aquarii.** Mag. 4.5				**Bradley 2777.** Mag. 5.9				**3 Piscis Australis.** Mag. 5.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 3		+38 19		21 4		−11 43		21 7		+77 46		21 8		−27 58	
	s		″		s		″		s		″		s		″	
Jan. 1.1	0.85		34.5		53.86		22.1		7.52		47.3		10.79		26.3	
11.1	0.82	3	32.2	23	53.88	2	22.3	2	6.93	59	44.7	26	10.80	1	25.6	7
21.0	0.83	1	29.7	25	53.92	4	22.5	2	6.51	42	41.7	30	10.85	5	24.8	8
31.0	0.88	5	27.1	26	54.00	8	22.6	1	6.28	23	38.5	32	10.93	8	23.9	9
Feb. 10.0	0.97	9	24.6	25	54.11	11	22.6	0	6.24	4	35.2	33	11.05	12	22.8	11
20.0	1.11	14	22.2	24	54.25	14	22.4	2	6.39	15	32.0	32	11.21	16	21.6	12
Mar. 1.9	1.29	18	20.1	21	54.42	17	22.0	4	6.74	35	28.9	31	11.39	18	20.3	13
11.9	1.51	22	18.4	17	54.62	20	21.4	6	7.27	53	26.2	27	11.61	22	18.9	14
21.9	1.77	26	17.1	13	54.85	23	20.7	7	7.95	68	23.8	24	11.86	25	17.4	15
31.9	2.07	30	16.3	8	55.10	25	19.7	10	8.77	82	21.9	19	12.13	27	15.8	16
Apr. 10.8	2.39	32	16.1	2	55.38	28	18.5	12	9.70	93	20.6	13	12.43	30	14.2	16
20.8	2.73	34	16.4	3	55.67	29	17.2	13	10.71	101	19.9	7	12.76	33	12.5	17
30.8	3.09	36	17.2	8	55.98	31	15.7	15	11.75	104	19.8	1	13.09	33	10.9	16
May 10.7	3.46	37	18.6	14	56.31	33	14.1	16	12.80	105	20.4	6	13.44	35	9.4	15
20.7	3.83	37	20.4	18	56.63	32	12.5	16	13.82	102	21.6	12	13.80	36	7.9	15
30.7	4.19	36	22.7	23	56.95	32	10.9	16	14.79	97	23.3	17	14.15	35	6.6	13
June 9.7	4.52	33	25.3	26	57.26	31	9.3	16	15.67	88	25.5	22	14.49	34	5.5	11
19.6	4.83	31	28.3	30	57.55	29	7.7	16	16.43	76	28.2	27	14.82	33	4.5	10
29.6	5.11	28	31.5	32	57.82	27	6.3	14	17.07	64	31.2	30	15.12	30	3.8	7
July 9.6	5.34	23	34.7	32	58.06	24	5.1	12	17.56	49	34.6	34	15.38	26	3.4	4
19.6	5.52	18	38.1	34	58.26	20	4.0	11	17.89	33	38.1	35	15.60	22	3.2	2
29.5	5.66	14	41.4	33	58.42	16	3.1	9	18.05	16	41.8	37	15.78	18	3.2	0
Aug. 8.5	5.74	8	44.6	32	58.53	11	2.4	7	18.04	1	45.6	38	15.91	13	3.5	3
18.5	5.77	3	47.7	31	58.60	7	1.9	5	17.87	17	49.3	37	15.99	8	3.9	4
28.4	5.75	2	50.6	29	58.62	2	1.6	3	17.53	34	52.9	36	16.02	3	4.6	7
Sept. 7.4	5.68	7	53.2	26	58.60	2	1.5	1	17.03	50	56.3	34	16.00	2	5.3	7
17.4	5.57	11	55.5	23	58.54	6	1.5	0	16.40	63	59.5	32	15.93	7	6.2	9
27.4	5.42	15	57.5	20	58.45	9	1.7	2	15.64	76	62.3	28	15.83	10	7.0	8
Oct. 7.3	5.24	18	59.0	15	58.33	12	2.0	3	14.78	86	64.8	25	15.70	13	7.9	9
17.3	5.05	19	60.2	12	58.20	13	2.3	3	13.83	95	66.8	20	15.55	15	8.6	7
27.3	4.85	20	60.9	7	58.06	14	2.7	4	12.81	102	68.4	16	15.39	16	9.3	7
Nov. 6.3	4.64	21	61.1	2	57.92	14	3.1	4	11.76	105	69.4	10	15.23	16	9.8	5
16.2	4.44	20	60.9	2	57.79	13	3.5	4	10.70	106	69.8	4	15.08	15	10.2	4
26.2	4.26	18	60.3	6	57.67	12	4.0	5	9.66	104	69.6	2	14.95	13	10.3	1
Dec. 6.2	4.10	16	59.1	12	57.57	10	4.4	4	8.67	99	68.9	7	14.84	11	10.3	0
16.1	3.97	13	57.6	15	57.51	6	4.8	4	7.75	92	67.5	14	14.76	8	10.1	2
26.1	3.87	10	55.7	19	57.47	4	5.1	3	6.94	81	65.6	19	14.71	5	9.8	3
36.1	3.81	6	53.5	22	57.46	1	5.4	3	6.26	68	63.3	23	14.70	1	9.2	6
Sec δ, Tan δ	1.275		+0.790		1.021		−0.207		4.724		+4.617		1.133		−0.531	
Mean Place	$2^{\mathrm{s}}.410$		$33''.29$		$54^{\mathrm{s}}.637$		$13''.44$		$14^{\mathrm{s}}.627$		$40''.18$		$11^{\mathrm{s}}.517$		$14''.56$	
$D'_{\psi}a$, $D_{\omega}a$	−0.01		−0.04		0.00		+0.01		−0.08		−0.22		+0.01		+0.03	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Cygni. Mag. 3.4				τ Cygni. Mag. 3.8				α Equulei. Mag. 4.1				σ Cygni. Mag. 4.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 9		+29 52		21 11		+37 40		21 11		+ 4 53		21 14		+39 1	
	s		″		s		″		s		″		s		″	
Jan. 1.1	15.24		25.3		19.97		42.2		30.64		25.3		0.71		64.5	
11.1	15.21	3	23.2	21	19.91	6	39.9	23	30.64	0	24.2	11	0.65	6	62.2	23
21.0	15.21	0	20.9	23	19.89	2	37.4	25	30.67	3	23.1	11	0.63	2	59.7	25
31.0	15.25	4	18.6	23	19.92	3	34.8	26	30.73	6	22.1	10	0.65	2	57.0	27
Feb. 10.0	15.32	7	16.3	23	19.99	7	32.3	25	30.82	9	21.1	10	0.72	7	54.4	26
20.0	15.44	12	14.2	21	20.10	11	29.8	25	30.94	12	20.3	8	0.83	11	51.9	25
Mar. 1.9	15.60	16	12.4	18	20.26	16	27.6	22	31.10	16	19.7	6	0.98	15	49.7	22
11.9	15.79	19	10.9	15	20.46	20	25.8	18	31.28	18	19.4	3	1.17	19	47.7	20
21.9	16.02	23	9.7	12	20.70	24	24.4	14	31.49	21	19.4	0	1.41	24	46.2	15
31.9	16.28	26	9.0	7	20.97	27	23.4	10	31.73	24	19.7	3	1.69	28	45.2	10
Apr. 10.8	16.56	28	8.9	1	21.27	30	23.0	4	32.00	27	20.3	6	2.00	31	44.7	5
20.8	16.87	31	9.2	3	21.60	33	23.1	1	32.28	28	21.3	10	2.33	33	44.7	0
30.8	17.20	33	10.0	8	21.95	35	23.8	7	32.58	30	22.6	13	2.68	35	45.3	6
May 10.7	17.53	33	11.3	13	22.31	36	25.0	12	32.89	31	24.1	15	3.04	36	46.5	12
20.7	17.87	34	13.0	17	22.67	36	26.6	16	33.21	32	25.8	17	3.40	36	48.1	16
30.7	18.20	33	15.1	21	23.02	35	28.7	21	33.52	31	27.8	20	3.76	36	50.2	21
June 9.7	18.52	32	17.5	24	23.35	33	31.2	25	33.82	30	29.8	20	4.10	34	52.6	24
19.6	18.81	29	20.2	27	23.66	31	34.0	28	34.11	29	31.9	21	4.41	31	55.4	28
29.6	19.08	27	23.0	28	23.93	27	37.0	30	34.37	26	34.0	21	4.69	28	58.4	30
July 9.6	19.30	22	26.0	30	24.17	24	40.1	31	34.60	23	36.1	21	4.93	24	61.6	32
19.6	19.49	19	29.0	30	24.36	19	43.3	32	34.79	19	38.0	19	5.12	19	64.8	32
29.5	19.63	14	31.9	29	24.50	14	46.6	33	34.95	16	39.8	18	5.27	15	68.1	33
Aug. 8.5	19.72	9	34.8	29	24.59	9	49.8	32	35.06	11	41.5	17	5.36	9	71.3	32
18.5	19.76	4	37.5	27	24.63	4	52.8	30	35.12	6	43.0	15	5.40	4	74.4	31
28.4	19.76	0	40.0	25	24.62	1	55.6	28	35.14	2	44.2	12	5.38	2	77.2	28
Sept. 7.4	19.71	5	42.3	23	24.55	7	58.2	26	35.12	2	45.2	10	5.32	6	79.9	27
17.4	19.62	9	44.2	19	24.45	10	60.5	23	35.06	6	46.0	8	5.22	10	82.2	23
27.4	19.50	12	45.8	16	24.31	14	62.5	20	34.97	9	46.6	6	5.07	15	84.3	21
Oct. 7.3	19.35	15	47.2	14	24.14	17	64.1	16	34.86	11	47.0	4	4.90	17	85.9	16
17.3	19.18	17	48.1	9	23.94	20	65.3	12	34.73	13	47.1	1	4.70	20	87.1	12
27.3	19.00	18	48.6	5	23.74	20	66.0	7	34.59	14	47.1	0	4.49	21	87.9	8
Nov. 6.3	18.82	18	48.7	1	23.53	21	66.4	4	34.45	14	46.8	3	4.28	21	88.3	4
16.2	18.64	18	48.4	3	23.33	20	66.2	2	34.31	14	46.4	4	4.07	21	88.2	1
26.2	18.48	16	47.8	6	23.14	19	65.6	6	34.19	12	45.8	6	3.87	20	87.6	6
Dec. 6.2	18.34	14	46.7	11	22.97	17	64.5	11	34.09	10	45.0	8	3.69	18	86.5	11
16.1	18.22	12	45.3	14	22.82	15	63.0	15	34.02	7	44.1	9	3.54	15	85.1	14
26.1	18.13	9	43.5	18	22.71	11	61.2	18	33.97	5	43.1	10	3.42	12	83.2	19
36.1	18.07	6	41.5	20	22.62	9	59.0	22	33.95	2	42.0	11	3.33	9	81.0	22
Sec δ, Tan δ	1.154		+0.574		1.263		+0.772		1.004		+0.085		1.288		+0.811	
Mean Place	$16^s.519$		$24''.99$		$21^s.454$		$40''.22$		$31^s.508$		$30''.24$		$2^s.237$		$62''.06$	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.01		−0.03		−0.01		−0.04		0.00		0.00		−0.01		−0.04	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ¹ Microscopii. Mag. 4.9				α Cephei. Mag. 2.6				ι Capricorni. Mag. 4.3				1 Pegasi. Mag. 4.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 21 15		° ′ −41 10		h m 21 16		° ′ +62 12		h m 21 17		° ′ −17 11		h m 21 18		° ′ +19 25	
	s		″		s		″		s		″		s		″	
Jan. 1.1	15.02		39.3		28.77		81.7		26.92		74.5		5.50		68.4	
11.1	15.02	0	37.9	14	28.56	21	79.1	26	26.92	0	74.5	0	5.48	2	66.7	17
21.1	15.05	3	36.4	15	28.42	14	76.2	29	26.96	4	74.4	1	5.49	1	64.9	18
31.0	15.14	9	34.6	18	28.36	6	73.1	31	27.03	7	74.1	3	5.53	4	63.1	18
Feb. 10.0	15.26	12	32.8	18	28.38	2	69.9	32	27.13	10	73.6	5	5.61	8	61.4	17
20.0	15.42	16	30.8	20	28.49	11	66.8	31	27.26	13	73.1	5	5.72	11	59.8	16
Mar. 1.9	15.62	20	28.7	21	28.68	19	63.8	30	27.42	16	72.3	8	5.86	14	58.4	14
11.9	15.86	24	26.6	21	28.94	26	61.2	26	27.62	20	71.4	9	6.04	18	57.3	11
21.9	16.14	28	24.5	21	29.28	34	59.0	22	27.84	22	70.4	10	6.25	21	56.6	7
31.9	16.45	31	22.5	20	29.68	40	57.3	17	28.09	25	69.1	13	6.49	24	56.4	2
Apr. 10.8	16.79	34	20.5	20	30.13	45	56.2	11	28.36	27	67.8	13	6.76	27	56.5	1
20.8	17.15	36	18.6	19	30.63	50	55.7	5	28.66	30	66.3	15	7.05	29	57.0	5
30.8	17.53	38	16.8	18	31.16	53	55.7	0	28.97	31	64.7	16	7.36	31	58.0	10
May 10.8	17.93	40	15.3	15	31.69	53	56.5	8	29.30	33	63.0	17	7.68	32	59.4	14
20.7	18.33	40	13.9	14	32.22	53	57.8	13	29.63	33	61.4	16	8.00	32	61.1	17
30.7	18.74	41	12.9	10	32.73	51	59.6	18	29.96	33	59.8	16	8.32	32	63.2	21
June 9.7	19.13	39	12.1	8	33.20	47	62.0	24	30.28	32	58.3	15	8.63	31	65.5	23
19.6	19.50	37	11.6	5	33.63	43	64.7	27	30.59	31	56.9	14	8.92	29	67.9	24
29.6	19.84	34	11.4	2	34.01	38	67.9	32	30.87	28	55.6	13	9.19	27	70.5	26
July 9.6	20.15	31	11.6	2	34.32	31	71.3	34	31.13	26	54.6	10	9.42	23	73.1	26
19.6	20.41	26	12.1	5	34.56	24	74.9	36	31.34	21	53.8	8	9.61	19	75.7	26
29.5	20.61	20	12.8	7	34.71	15	78.6	37	31.52	18	53.2	6	9.76	15	78.3	26
Aug. 8.5	20.77	16	13.8	10	34.79	8	82.3	37	31.65	13	52.7	5	9.87	11	80.7	24
18.5	20.86	9	15.0	12	34.79	0	85.9	36	31.73	8	52.6	1	9.93	6	82.9	22
28.5	20.89	3	16.3	13	34.70	9	89.4	35	31.76	3	52.6	0	9.95	2	85.0	21
Sept. 7.4	20.87	2	17.7	14	34.54	16	92.7	33	31.75	1	52.8	2	9.93	2	86.8	18
17.4	20.80	7	19.2	15	34.32	22	95.8	31	31.70	5	53.1	3	9.86	7	88.3	15
27.4	20.68	12	20.6	14	34.03	29	98.5	27	31.62	8	53.5	4	9.76	10	89.6	13
Oct. 7.3	20.52	16	21.8	12	33.69	34	100.8	23	31.51	11	54.0	5	9.64	12	90.5	9
17.3	20.34	18	22.9	11	33.31	38	102.7	19	31.38	13	54.5	5	9.50	14	91.2	7
27.3	20.15	19	23.8	9	32.91	40	104.1	14	31.24	14	55.0	5	9.35	15	91.5	3
Nov. 6.3	19.95	20	24.4	6	32.49	42	104.9	8	31.09	15	55.5	5	9.19	16	91.5	0
16.2	19.76	19	24.6	2	32.07	42	105.2	3	30.96	13	56.0	5	9.04	15	91.2	3
26.2	19.58	18	24.6	0	31.66	41	104.9	3	30.83	13	56.4	4	8.90	14	90.6	6
Dec. 6.2	19.44	14	24.3	3	31.27	39	104.0	9	30.73	10	56.7	3	8.78	12	89.7	9
16.2	19.32	12	23.6	7	30.92	35	102.6	14	30.66	7	56.9	2	8.69	9	88.5	12
26.1	19.25	7	22.6	10	30.62	30	100.7	19	30.61	5	57.0	1	8.61	8	87.1	14
36.1	19.21	4	21.4	12	30.37	25	98.3	24	30.59	2	57.0	0	8.57	4	85.4	17
Sec δ, Tan δ	1.328		−0.874		2.146		+1.898		1.047		−0.310		1.061		+0.353	
Mean Place	15ˢ.754		25″.33		31ˢ.718		75″.30		27ˢ.619		64″.98		6ˢ.542		69″.75	
D′ψ α, Dω α	+0.02		+0.04		−0.03		−0.10		+0.01		+0.02		−0.01		−0.02	
Dψ δ, Dω δ	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.6	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**γ Pavonis.** Mag. 4.3				**ζ Capricorni.** Mag. 3.9				**g Cygni.** Mag. 5.3				**β Aquarii.** Mag. 3.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° '		h m		° '		h m		° '		h m		° '	
	21 19		−65 45		21 21		−22 46		21 26		+46 9		21 27		− 5 56	
	s		"		s		"		s		"		s		"	
Jan. 1.1	19.68		39.4		44.93		74.5		14.75		44.5		1.24		67.2	
11.1	19.58	10	36.9	25	44.94	1	74.2	3	14.65	10	42.1	24	1.23	1	67.8	6
21.1	19.58	0	34.0	29	44.97	3	73.7	5	14.59	6	39.5	26	1.26	3	68.3	5
31.0	19.65	7	31.0	30	45.03	6	73.0	7	14.58	1	36.7	28	1.31	5	68.6	3
Feb. 10.0	19.81	16	27.9	31	45.13	10	72.3	7	14.62	4	33.9	28	1.39	8	68.9	3
20.0	20.05	24	24.7	32	45.27	14	71.4	9	14.71	9	31.1	28	1.51	12	69.0	1
Mar. 1.9	20.37	32	21.6	31	45.43	16	70.3	11	14.86	15	28.6	25	1.65	14	68.9	1
11.9	20.76	39	18.6	30	45.62	19	69.1	12	15.05	19	26.4	22	1.83	18	68.6	3
21.9	21.21	45	15.7	29	45.85	23	67.7	14	15.30	25	24.6	18	2.03	20	68.0	6
31.9	21.72	51	13.0	27	46.10	25	66.2	15	15.58	28	23.2	14	2.26	23	67.2	8
Apr. 10.8	22.28	56	10.5	25	46.38	28	64.6	16	15.91	33	22.4	8	2.52	26	66.2	10
20.8	22.88	60	8.4	21	46.69	31	63.0	16	16.27	36	22.2	2	2.80	28	65.0	12
30.8	23.52	64	6.6	18	47.01	32	61.3	17	16.65	38	22.5	3	3.10	30	63.5	15
May 10.8	24.18	66	5.2	14	47.34	33	59.7	16	17.04	39	23.4	9	3.42	32	61.9	16
20.7	24.85	67	4.2	10	47.69	35	58.1	16	17.43	39	24.9	15	3.74	32	60.1	18
30.7	25.51	66	3.7	5	48.03	34	56.5	16	17.82	39	26.8	19	4.06	32	58.3	18
June 9.7	26.15	64	3.6	1	48.36	33	55.1	14	18.19	37	29.2	24	4.37	31	56.5	18
19.6	26.76	61	4.0	4	48.68	32	53.9	12	18.54	35	31.9	27	4.67	30	54.7	18
29.6	27.31	55	4.7	7	48.98	30	52.9	10	18.84	30	34.9	30	4.94	27	52.9	18
July 9.6	27.80	49	5.9	12	49.24	26	52.1	8	19.11	27	38.2	33	5.19	25	51.3	16
19.6	28.22	42	7.5	16	49.47	23	51.5	6	19.33	22	41.6	34	5.40	21	49.9	14
29.5	28.55	33	9.4	19	49.65	18	51.2	3	19.49	16	45.0	34	5.57	17	48.6	13
Aug. 8.5	28.78	23	11.5	21	49.79	14	51.1	1	19.59	10	48.4	34	5.70	13	47.5	11
18.5	28.90	12	13.8	23	49.88	9	51.3	2	19.64	5	51.8	34	5.79	9	46.6	9
28.5	28.93	3	16.2	24	49.92	4	51.6	3	19.63	1	55.0	32	5.83	4	46.0	6
Sept. 7.4	28.85	8	18.6	24	49.92	0	52.1	5	19.57	6	57.9	29	5.83	0	45.5	5
17.4	28.68	17	20.8	22	49.87	5	52.7	6	19.45	12	60.6	27	5.79	4	45.3	2
27.4	28.43	25	22.9	21	49.78	9	53.4	7	19.30	15	63.0	24	5.71	8	45.2	1
Oct. 7.3	28.10	33	24.7	18	49.67	11	54.1	7	19.11	19	65.0	20	5.61	10	45.2	0
17.3	27.72	38	26.1	14	49.53	14	54.8	7	18.89	22	66.5	15	5.49	12	45.4	2
27.3	27.31	41	27.1	10	49.39	14	55.5	7	18.65	24	67.6	11	5.36	13	45.7	3
Nov. 6.3	26.88	43	27.6	5	49.24	15	56.0	5	18.40	25	68.3	7	5.23	13	46.1	4
16.2	26.46	42	27.6	0	49.09	15	56.5	5	18.16	24	68.4	1	5.10	13	46.6	5
26.2	26.06	40	27.0	6	48.96	13	56.8	3	17.92	24	68.0	4	4.98	12	47.1	5
Dec. 6.2	25.71	35	26.0	10	48.85	11	57.0	2	17.70	22	67.1	9	4.88	10	47.6	5
16.2	25.41	30	24.4	16	48.77	8	57.0	0	17.51	19	65.7	14	4.80	8	48.2	6
26.1	25.18	23	22.4	20	48.72	5	56.9	1	17.34	17	63.9	18	4.75	5	48.8	6
36.1	25.04	14	20.1	23	48.70	2	56.6	3	17.22	12	61.8	21	4.72	3	49.4	6
Sec δ, Tan δ	2.435		−2.220		1.085		−0.420		1.444		+1.042		1.005		−0.104	
Mean Place	$20^{s}.870$		$22''.59$		$45^{s}.602$		$63''.84$		$16^{s}.503$		$39''.69$		$1^{s}.963$		$60''.33$	
D'ψ α, Dω α	+0.04		+0.11		+0.01		+0.02		−0.02		−0.05		0.00		+0.01	
Dψ δ, Dω δ	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Cephei. Mag. 3.3				ξ Aquarii. Mag. 4.8				74 Cygni. Mag. 5.1				γ Capricorni. Mag. 3.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 27		+70 10		21 33		− 8 14		21 33		+40 1		21 35		−17 2	
	s		″		s		″		s		″		s		″	
Jan. 1.1	29.24		67.3		9.82		32.7		28.60		40.4		19.07		73.7	
11.1	28.88	36	64.8	25	9.81	1	33.1	4	28.52	8	38.2	22	19.06	1	73.7	0
21.1	28.62	26	62.0	28	9.83	2	33.5	4	28.47	5	35.7	25	19.08	2	73.5	2
31.0	28.46	16	58.9	31	9.88	5	33.7	2	28.47	0	33.1	26	19.13	5	73.2	3
Feb. 10.0	28.42	4	55.6	33	9.96	8	33.8	1	28.51	4	30.5	26	19.21	8	72.7	5
20.0	28.49	7	52.4	32	10.07	11	33.8	0	28.60	9	28.0	25	19.32	11	72.1	6
Mar. 2.0	28.68	19	49.3	31	10.21	14	33.5	3	28.73	13	25.7	23	19.47	15	71.4	7
11.9	28.99	31	46.5	28	10.38	17	33.1	4	28.90	17	23.7	20	19.64	17	70.4	10
21.9	29.41	42	44.1	24	10.58	20	32.4	7	29.12	22	22.1	16	19.85	21	69.3	11
31.9	29.91	50	42.1	20	10.81	23	31.5	9	29.38	26	20.9	12	20.08	23	68.0	13
Apr. 10.8	30.49	58	40.7	14	11.06	25	30.4	11	29.68	30	20.2	7	20.35	27	66.5	15
20.8	31.13	64	39.9	8	11.34	28	29.0	14	30.01	33	20.1	1	20.63	28	65.0	15
30.8	31.81	68	39.7	2	11.64	30	27.5	15	30.36	35	20.5	4	20.94	31	63.3	17
May 10.8	32.50	69	40.1	4	11.95	31	25.8	17	30.72	36	21.4	9	21.27	33	61.6	17
20.7	33.19	69	41.2	11	12.28	33	24.1	17	31.09	37	22.9	15	21.60	33	59.8	18
30.7	33.86	67	42.8	16	12.60	32	22.3	18	31.46	37	24.9	20	21.93	33	58.1	17
June 9.7	34.49	63	44.9	21	12.91	31	20.5	18	31.81	35	27.2	23	22.26	33	56.5	16
19.7	35.06	57	47.5	26	13.22	31	18.8	17	32.14	33	29.8	26	22.57	31	55.0	15
29.6	35.55	49	50.6	31	13.50	28	17.1	17	32.44	30	32.7	29	22.87	30	53.7	13
July 9.6	35.95	40	53.9	33	13.75	25	15.6	15	32.70	26	35.9	32	23.13	26	52.5	12
19.6	36.26	31	57.4	35	13.97	22	14.2	14	32.92	22	39.1	32	23.36	23	51.6	9
29.5	36.46	20	61.1	37	14.15	18	13.0	12	33.09	17	42.4	33	23.55	19	50.9	7
Aug. 8.5	36.56	10	64.9	38	14.29	14	12.1	9	33.20	11	45.6	32	23.70	15	50.5	4
18.5	36.55	1	68.6	37	14.38	9	11.3	8	33.27	7	48.8	32	23.80	10	50.3	2
28.5	36.43	12	72.3	37	14.43	5	10.8	5	33.28	1	51.8	30	23.85	5	50.2	1
Sept. 7.4	36.21	22	75.8	35	14.43	0	10.5	3	33.24	4	54.6	28	23.86	1	50.4	2
17.4	35.90	31	79.1	33	14.40	3	10.3	2	33.15	9	57.1	25	23.83	3	50.7	3
27.4	35.51	39	82.0	29	14.33	7	10.3	0	33.03	12	59.3	22	23.76	7	51.2	5
Oct. 7.4	35.04	47	84.6	26	14.23	10	10.5	2	32.87	16	61.1	18	23.66	10	51.7	5
17.3	34.52	52	86.8	22	14.12	11	10.8	3	32.69	18	62.5	14	23.54	12	52.3	6
27.3	33.95	57	88.5	17	13.99	13	11.1	3	32.49	20	63.6	11	23.40	14	52.9	6
Nov. 6.3	33.35	60	89.7	12	13.85	14	11.5	4	32.28	21	64.1	5	23.26	14	53.4	5
16.2	32.74	61	90.3	6	13.72	13	12.0	5	32.07	21	64.2	1	23.13	13	54.0	6
26.2	32.13	61	90.2	1	13.60	12	12.5	5	31.87	20	63.8	4	23.00	13	54.4	4
Dec. 6.2	31.55	58	89.6	6	13.50	10	13.0	5	31.68	19	63.0	8	22.90	10	54.7	3
16.2	31.01	54	88.5	11	13.42	8	13.6	6	31.52	16	61.8	12	22.81	9	55.0	3
26.1	30.53	48	86.7	18	13.37	5	14.1	5	31.38	14	60.1	17	22.75	6	55.2	2
36.1	30.12	41	84.5	22	13.34	3	14.5	4	31.27	11	58.0	21	22.72	3	55.2	0
Sec δ, Tan δ	2.949		+2.775		1.010		−0.145		1.306		+0.840		1.047		−0.307	
Mean Place	33ˢ.375		58″.88		10ˢ.503		25″.44		30ˢ.081		36″.21		19ˢ.695		64″.40	
D′ψ α, Dω α	−0.05		−0.15		0.00		+0.01		−0.01		−0.04		0.00		+0.02	
Dψ δ, Dω δ	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Octantis. Mag. 5.4				ε Pegasi. Mag. 2.5				11 Cephei. Mag. 4.8				δ Capricorni. Mag. 3.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 21 37		° ′ −83 6		h m 21 39		° ′ + 9 28		h m 21 40		° ′ +70 54		h m 21 42		° ′ −16 30	
	s		″		s		″		s		″		s		″	
Jan. 1.1	47.41	73	74.0	31	56.90	3	46.1	12	35.77	40	64.6	24	17.16	1	74.1	0
11.1	46.68	43	70.9	33	56.87	0	44.9	13	35.37	31	62.2	27	17.15	1	74.1	2
21.1	46.25	13	67.6	36	56.87	3	43.6	12	35.06	20	59.5	30	17.16	4	73.9	2
31.0	46.12	17	64.0	37	56.90	6	42.4	12	34.86	8	56.5	32	17.20	8	73.7	5
Feb. 10.0	46.29	47	60.3	37	56.96	10	41.2	10	34.78	4	53.3	32	17.28	10	73.2	5
20.0	46.76	75	56.6	37	57.06	12	40.2	8	34.82	16	50.1	31	17.38	14	72.7	8
Mar. 2.0	47.51	101	52.9	35	57.18	16	39.4	5	34.98	28	47.0	29	17.52	17	71.9	9
11.9	48.52	126	49.4	33	57.34	19	38.9	3	35.26	40	44.1	25	17.69	20	71.0	12
21.9	49.78	146	46.1	31	57.53	22	38.6	1	35.66	49	41.6	21	17.89	22	69.8	13
31.9	51.24	165	43.0	27	57.75	25	38.7	5	36.15	58	39.5	16	18.11	26	68.5	14
Apr. 10.9	52.89	180	40.3	23	58.00	27	39.2	8	36.73	65	37.9	9	18.37	28	67.1	16
20.8	54.69	192	38.0	19	58.27	29	40.0	12	37.38	69	37.0	4	18.65	31	65.5	17
30.8	56.61	199	36.1	14	58.56	31	41.2	14	38.07	72	36.6	3	18.96	32	63.8	17
May 10.8	58.60	202	34.7	9	58.87	32	42.6	17	38.79	72	36.9	8	19.28	33	62.1	18
20.7	60.62	201	33.8	4	59.19	32	44.3	20	39.51	70	37.7	15	19.61	33	60.3	17
30.7	62.63	196	33.4	2	59.51	31	46.3	21	40.21	66	39.2	20	19.94	33	58.6	17
June 9.7	64.59	186	33.6	7	59.82	30	48.4	22	40.87	61	41.2	24	20.27	32	56.9	15
19.7	66.45	170	34.3	11	60.12	27	50.6	23	41.48	54	43.6	29	20.59	29	55.4	14
29.6	68.15	152	35.4	16	60.39	25	52.9	23	42.02	45	46.5	32	20.88	27	54.0	12
July 9.6	69.67	128	37.0	20	60.64	22	55.2	22	42.47	35	49.7	35	21.15	24	52.8	10
19.6	70.95	101	39.0	24	60.86	18	57.4	21	42.82	25	53.2	37	21.39	20	51.8	7
29.6	71.96	70	41.4	26	61.04	13	59.5	19	43.07	13	56.9	38	21.59	15	51.1	5
Aug. 8.5	72.66	39	44.0	28	61.17	9	61.4	18	43.20	3	60.7	38	21.74	10	50.6	3
18.5	73.05	5	46.8	29	61.26	4	63.2	16	43.23	8	64.5	37	21.84	6	50.3	0
28.5	73.10	29	49.7	28	61.30	1	64.8	13	43.15	18	68.2	36	21.90	2	50.3	2
Sept. 7.4	72.81	61	52.5	27	61.31	4	66.1	11	42.97	29	71.8	34	21.92	3	50.5	3
17.4	72.20	92	55.2	25	61.27	7	67.2	9	42.68	37	75.2	31	21.89	6	50.8	4
27.4	71.28	118	57.7	21	61.20	9	68.1	6	42.31	45	78.3	27	21.83	10	51.2	5
Oct. 7.4	70.10	139	59.8	17	61.11	12	68.7	4	41.86	52	81.0	24	21.73	11	51.7	6
17.3	68.71	156	61.5	12	60.99	13	69.1	1	41.34	57	83.4	19	21.62	13	52.3	6
27.3	67.15	166	62.7	5	60.86	14	69.2	1	40.77	61	85.3	13	21.49	14	52.9	6
Nov. 6.3	65.49	168	63.2	0	60.72	13	69.1	3	40.16	62	86.6	8	21.35	13	53.5	5
16.3	63.81	165	63.2	6	60.59	12	68.8	5	39.54	63	87.4	2	21.22	13	54.0	5
26.2	62.16	154	62.6	13	60.47	11	68.3	8	38.91	61	87.6	4	21.09	11	54.5	4
Dec. 6.2	60.62	138	61.3	19	60.36	10	67.5	9	38.30	57	87.2	9	20.98	9	54.9	3
16.2	59.24	117	59.4	24	60.26	7	66.6	10	37.73	52	86.3	16	20.89	6	55.2	2
26.1	58.07	91	57.0	28	60.19	4	65.6	12	37.21	45	84.7	21	20.83	4	55.4	1
36.1	57.16		54.2		60.15		64.4		36.76		82.6		20.79		55.5	
Sec δ, Tan δ	8.342		−8.282		1.014		+0.167		3.059		+2.890		1.043		−0.297	
Mean Place	50ˢ.956		55″.92		57ˢ.714		48″.72		39ˢ.951		54″.86		17ˢ.756		64″.99	
D′ψα, Dωα	+0.13		+0.45		0.00		−0.01		−0.04		−0.16		0.00		+0.02	
Dψδ, Dωδ	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π^2 Cygni. Mag. 4.3				μ Capricorni. Mag. 5.2				γ Gruis. Mag. 3.2				16 Pegasi. Mag. 5.0		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		° ′
	21 43		+48 54		21 48		−13 57		21 48		−37 45		21 49		+25 31
	s		″		s		″		s		″		s		″
Jan. 1.1	35.10		47.3		35.95		34.3		42.98		85.3		7.87		14.5
11.1	34.97	13	45.0	23	35.92	3	34.4	1	42.94	4	84.2	11	7.81	6	12.7
21.1	34.88	9	42.5	25	35.93	1	34.4	0	42.94	0	82.9	13	7.78	3	10.8
31.0	34.84	4	39.7	28	35.96	3	34.3	1	42.98	4	81.4	15	7.79	1	8.9
Feb. 10.0	34.85	1	36.9	28	36.03	7	34.0	3	43.05	7	79.7	17	7.83	4	6.9
20.0	34.91	6	34.1	28	36.13	10	33.6	4	43.16	11	77.8	19	7.90	7	5.1
Mar. 2.0	35.04	13	31.4	27	36.26	13	33.0	6	43.31	15	75.7	21	8.01	11	3.4
11.9	35.21	17	29.1	23	36.42	16	32.1	9	43.50	19	73.6	21	8.16	15	2.0
21.9	35.44	23	27.1	20	36.61	19	31.1	10	43.73	23	71.5	21	8.35	19	1.0
31.9	35.72	28	25.5	16	36.83	22	29.9	12	43.99	26	69.3	22	8.57	22	0.3
Apr. 10.9	36.05	33	24.5	10	37.08	25	28.5	14	44.28	29	67.1	22	8.83	26	0.1
20.8	36.41	36	24.0	5	37.35	27	27.0	15	44.61	33	64.9	22	9.11	28	0.3
30.8	36.80	39	24.1	1	37.65	30	25.3	17	44.96	35	62.9	20	9.42	31	1.0
May 10.8	37.20	40	24.8	7	37.97	32	23.5	18	45.33	37	61.0	19	9.74	32	2.2
20.7	37.62	42	26.0	12	38.29	32	21.7	18	45.71	38	59.3	17	10.08	34	3.7
30.7	38.03	41	27.8	18	38.62	33	19.9	18	46.10	39	57.8	15	10.41	33	5.6
June 9.7	38.42	39	30.0	22	38.95	33	18.2	17	46.48	38	56.6	12	10.74	33	7.8
19.7	38.79	37	32.6	26	39.26	31	16.5	17	46.85	37	55.7	9	11.05	31	10.3
29.6	39.13	34	35.5	29	39.56	30	15.0	15	47.20	35	55.1	6	11.34	29	12.9
July 9.6	39.42	29	38.7	32	39.83	27	13.7	13	47.52	32	54.8	3	11.60	26	15.7
19.6	39.66	24	42.1	34	40.07	24	12.6	11	47.80	28	54.9	1	11.82	22	18.5
29.6	39.85	19	45.6	35	40.27	20	11.7	9	48.04	24	55.3	4	12.01	19	21.3
Aug. 8.5	39.98	13	49.1	35	40.42	15	11.0	7	48.22	18	56.0	7	12.14	13	24.0
18.5	40.05	7	52.5	34	40.54	12	10.5	5	48.35	13	56.9	9	12.23	9	26.6
28.5	40.07	2	55.9	34	40.60	6	10.3	2	48.42	7	58.1	12	12.28	5	29.1
Sept. 7.4	40.02	5	59.0	31	40.62	2	10.3	0	48.44	2	59.4	13	12.28	0	31.3
17.4	39.92	10	61.9	29	40.60	2	10.5	2	48.41	3	60.8	14	12.24	4	33.2
27.4	39.78	14	64.5	26	40.54	6	10.8	3	48.33	8	62.2	14	12.16	8	34.9
Oct. 7.4	39.59	19	66.7	22	40.45	9	11.2	4	48.21	12	63.6	14	12.06	10	36.2
17.3	39.38	21	68.5	18	40.34	11	11.7	5	48.06	15	64.8	12	11.93	13	37.3
27.3	39.14	24	69.9	14	40.22	12	12.3	6	47.90	16	65.9	11	11.78	15	38.0
Nov. 6.3	38.88	26	70.8	9	40.09	13	12.8	5	47.72	18	66.7	8	11.63	15	38.3
16.3	38.63	25	71.1	3	39.96	13	13.3	5	47.54	18	67.3	6	11.47	16	38.3
26.2	38.38	25	71.0	1	39.84	12	13.8	5	47.37	17	67.6	3	11.32	15	37.9
Dec. 6.2	38.13	25	70.3	7	39.73	11	14.3	5	47.22	15	67.6	0	11.18	14	37.1
16.2	37.91	22	69.2	11	39.64	9	14.7	4	47.09	13	67.3	3	11.06	12	36.1
26.1	37.72	19	67.5	17	39.57	7	15.0	3	47.00	9	66.7	6	10.96	10	34.7
36.1	37.56	16	65.5	20	39.53	4	15.2	2	46.94	6	65.8	9	10.88	8	33.1
Sec δ, Tan δ	1.521		+1.147		1.031		−0.248		1.265		−0.775		1.108		+0.477
Mean Place	$36^s.895$		$40''.63$		$36^s.522$		$25''.96$		$43^s.492$		$71''.67$		$8^s.897$		$12''.58$
$D'_\psi a$, $D_\omega a$	−0.02		−0.06		0.00		+0.01		+0.01		+0.04		−0.01		−0.03
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.6		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**79 Draconis.** Mag. 6.6				**ε Indi.** Mag. 4.7				**20 Pegasi.** Mag. 5.7				**α Aquarii.** Mag. 3.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 21 51 s		° ′ +73 17 ″		h m 21 56 s		° ′ −57 8 ″		h m 21 56 s		° ′ +12 42 ″		h m 22 1 s		° ′ − 0 43 ″	
Jan. 1.1	42.41		54.0		46.72		40.4		53.16		26.0		21.43		81.4	
11.1	41.91	50	51.8	22	46.62	10	38.5	19	53.12	4	24.7	13	21.40	3	82.1	7
21.1	41.52	39	49.1	27	46.58	4	36.3	22	53.11	1	23.4	13	21.39	1	82.8	7
31.1	41.24	28	46.2	29	46.60	2	33.8	25	53.12	1	22.0	14	21.41	2	83.4	6
Feb. 10.0	41.10	14	43.0	32	46.67	7	31.1	27	53.16	4	20.8	12	21.45	4	83.9	5
20.0	41.10	0	39.8	32	46.81	14	28.3	28	53.23	7	19.6	12	21.53	8	84.3	4
Mar. 2.0	41.24	14	36.7	31	47.00	19	25.4	29	53.34	11	18.6	10	21.64	11	84.5	2
11.9	41.51	27	33.7	30	47.25	25	22.4	30	53.48	14	17.9	7	21.78	14	84.4	1
21.9	41.92	41	31.1	26	47.55	30	19.5	29	53.66	18	17.5	4	21.95	17	84.1	3
31.9	42.45	53	28.9	22	47.90	35	16.7	28	53.86	20	17.4	1	22.15	20	83.5	6
Apr. 10.9	43.07	62	27.2	17	48.31	41	14.1	26	54.10	24	17.7	3	22.38	23	82.6	9
20.8	43.78	71	26.0	12	48.75	44	11.7	24	54.37	27	18.4	7	22.64	26	81.5	11
30.8	44.55	77	25.5	5	49.23	48	9.5	22	54.66	29	19.4	10	22.93	29	80.1	14
May 10.8	45.35	80	25.5	0	49.74	51	7.6	19	54.96	30	20.8	14	23.23	30	78.5	16
20.8	46.16	81	26.2	7	50.26	52	6.1	15	55.28	32	22.4	16	23.54	31	76.7	18
30.7	46.95	79	27.5	13	50.80	54	5.0	11	55.60	32	24.4	20	23.86	32	74.8	19
June 9.7	47.70	75	29.3	18	51.33	53	4.2	8	55.92	32	26.5	21	24.18	32	72.8	20
19.7	48.40	70	31.6	23	51.84	51	3.9	3	56.23	31	28.7	22	24.49	31	70.7	21
29.6	49.02	62	34.4	28	52.33	49	4.1	2	56.52	29	31.1	24	24.78	29	68.7	20
July 9.6	49.54	52	37.5	31	52.77	44	4.7	6	56.78	26	33.5	24	25.05	27	66.8	19
19.6	49.96	42	40.9	34	53.17	40	5.6	9	57.01	23	35.8	23	25.28	23	65.0	18
29.6	50.27	31	44.6	37	53.50	33	7.0	14	57.20	19	38.1	23	25.48	20	63.4	16
Aug. 8.5	50.45	18	48.3	37	53.76	26	8.7	17	57.34	14	40.2	21	25.64	16	61.9	15
18.5	50.51	6	52.1	38	53.95	19	10.6	19	57.45	11	42.2	20	25.76	12	60.7	12
28.5	50.45	6	55.9	38	54.06	11	12.8	22	57.51	6	44.0	18	25.83	7	59.7	10
Sept. 7.5	50.27	18	59.6	37	54.09	3	15.0	22	57.53	2	45.6	16	25.86	3	58.9	8
17.4	49.97	30	63.1	35	54.04	5	17.3	23	57.51	2	46.9	13	25.85	1	58.3	6
27.4	49.57	40	66.3	32	53.93	11	19.5	22	57.45	6	47.9	10	25.80	5	57.9	4
Oct. 7.4	49.08	49	69.2	29	53.75	18	21.6	21	57.37	8	48.7	8	25.73	7	57.8	1
17.3	48.51	57	71.7	25	53.53	22	23.4	18	57.26	11	49.3	6	25.63	10	57.8	0
27.3	47.87	64	73.8	21	53.27	26	24.8	14	57.14	12	49.6	3	25.51	12	57.9	1
Nov. 6.3	47.19	68	75.4	16	52.99	28	25.9	11	57.00	14	49.6	0	25.39	12	58.3	4
16.3	46.48	71	76.4	10	52.70	29	26.5	6	56.87	13	49.4	2	25.27	12	58.7	4
26.2	45.76	72	76.8	4	52.42	28	26.7	2	56.74	13	48.9	5	25.15	12	59.2	5
Dec. 6.2	45.05	71	76.6	2	52.16	26	26.4	3	56.63	11	48.3	6	25.04	11	59.8	6
16.2	44.38	67	75.8	8	51.94	22	25.6	8	56.53	10	47.4	9	24.94	10	60.5	7
26.2	43.76	62	74.5	13	51.76	18	24.3	13	56.45	8	46.3	11	24.87	7	61.2	7
36.1	43.21	55	72.6	19	51.62	14	22.7	16	56.39	6	45.1	12	24.82	5	61.9	7
Sec δ, Tan δ	3.479		+3.332		1.843		−1.548		1.025		+0.225		1.000		−0.013	
Mean Place	$47^{s}.091$		$42''.97$		$47^{s}.276$		$23''.55$		$53^{s}.949$		$27''.02$		$22^{s}.049$		$76''.88$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.05		−0.19		+0.02		+0.09		0.00		−0.01		0.00		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.5		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5	

Mean Solar Date.	ι Aquarii. Mag. 4.4				20 Cephei. Mag. 5.4				α Gruis. Mag. 2.2				ι Pegasi. Mag. 4.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 1		−14 16		22 2		+62 21		22 2		−47 22		22 2		+24 55	
	s		″		s		″		s		″		s		″	
Jan. 1.1	47.12		82.7		21.01		67.2		48.66		56.8		59.45		31.2	
11.1	47.09	3	82.8	1	20.74	27	65.0	22	48.58	8	55.3	15	59.38	7	29.6	16
21.1	47.09	0	82.8	0	20.53	21	62.5	25	48.55	3	53.5	18	59.35	3	27.8	18
31.1	47.11	2	82.6	2	20.39	14	59.7	28	48.56	1	51.5	20	59.34	1	25.9	19
Feb. 10.0	47.16	5	82.3	3	20.32	7	56.6	31	48.61	5	49.3	22	59.37	3	24.0	19
20.0	47.24	8	81.8	5	20.33	1	53.5	31	48.71	10	46.8	25	59.43	6	22.2	18
Mar. 2.0	47.36	12	81.2	6	20.43	10	50.6	29	48.86	15	44.3	25	59.53	10	20.6	16
11.9	47.50	14	80.3	9	20.61	18	47.8	28	49.05	19	41.6	27	59.66	13	19.2	14
21.9	47.68	18	79.2	11	20.87	26	45.3	25	49.28	23	39.0	26	59.83	17	18.2	10
31.9	47.89	21	77.9	13	21.20	33	43.2	21	49.56	28	36.3	27	60.04	21	17.5	7
Apr. 10.9	48.13	24	76.5	14	21.61	41	41.6	16	49.88	32	33.8	25	60.29	25	17.3	2
20.8	48.40	27	74.9	16	22.07	46	40.6	10	50.23	35	31.4	24	60.57	28	17.5	2
30.8	48.69	29	73.2	17	22.57	50	40.2	4	50.61	38	29.1	23	60.87	30	18.1	6
May 10.8	49.00	31	71.4	18	23.10	53	40.3	1	51.02	41	27.1	20	61.19	32	19.2	11
20.8	49.32	32	69.5	19	23.64	54	41.1	8	51.45	43	25.3	18	61.52	33	20.7	15
30.7	49.65	33	67.7	18	24.18	54	42.5	14	51.89	44	23.9	14	61.86	34	22.5	18
June 9.7	49.98	33	65.9	18	24.71	53	44.4	19	52.32	43	22.8	11	62.19	33	24.7	22
19.7	50.30	32	64.2	17	25.20	49	46.7	23	52.75	43	22.0	8	62.51	32	27.1	24
29.6	50.60	30	62.6	16	25.64	44	49.5	28	53.15	40	21.7	3	62.81	30	29.7	26
July 9.6	50.88	28	61.2	14	26.03	39	52.6	31	53.52	37	21.7	0	63.08	27	32.4	27
19.6	51.13	25	60.0	12	26.36	33	56.0	34	53.84	32	22.2	5	63.32	24	35.2	28
29.6	51.34	21	59.1	9	26.62	26	59.6	36	54.12	28	23.0	8	63.51	19	37.9	27
Aug. 8.5	51.51	17	58.4	7	26.80	18	63.3	37	54.34	22	24.1	11	63.66	15	40.6	27
18.5	51.63	12	58.0	4	26.89	9	67.0	37	54.50	16	25.5	14	63.77	11	43.2	26
28.5	51.71	8	57.8	2	26.91	2	70.7	37	54.60	10	27.1	16	63.83	6	45.6	24
Sept. 7.5	51.74	3	57.8	0	26.85	6	74.3	36	54.63	3	28.9	18	63.85	2	47.8	22
17.4	51.73	1	58.0	2	26.72	13	77.7	34	54.60	3	30.8	19	63.83	2	49.8	20
27.4	51.69	4	58.3	3	26.53	19	80.8	31	54.52	8	32.6	18	63.77	6	51.5	17
Oct. 7.4	51.61	8	58.8	5	26.27	26	83.5	27	54.39	13	34.4	18	63.67	10	52.9	14
17.3	51.51	10	59.3	5	25.96	31	85.9	24	54.22	17	36.0	16	63.55	12	54.0	11
27.3	51.39	12	59.9	6	25.61	35	87.9	20	54.02	20	37.3	13	63.42	13	54.8	8
Nov. 6.3	51.26	13	60.5	6	25.24	37	89.3	14	53.80	22	38.4	11	63.27	15	55.2	4
16.3	51.13	13	61.1	6	24.85	39	90.2	9	53.58	22	39.1	7	63.12	15	55.2	0
26.2	51.00	13	61.6	5	24.45	40	90.6	4	53.37	21	39.4	3	62.98	14	54.9	3
Dec. 6.2	50.89	11	62.1	5	24.06	39	90.4	2	53.17	20	39.3	1	62.84	14	54.3	6
16.2	50.80	9	62.5	4	23.68	38	89.6	8	52.99	18	38.8	5	62.72	12	53.3	10
26.2	50.73	7	62.8	3	23.34	34	88.2	14	52.85	14	37.9	9	62.62	10	52.0	13
36.1	50.68	5	63.0	2	23.04	30	86.3	19	52.75	10	36.6	13	62.53	9	50.5	15
Sec δ, Tan δ	1.032		−0.255		2.156		+1.910		1.477		−1.086		1.103		+0.465	
Mean Place	$47^{s}.635$		74″.54		$23^{s}.653$		56″.64		$49^{s}.096$		41″.36		$60^{s}.403$		28″.66	
D′ψ α, Dω α	0.00		+0.01		−0.02		−0.11		+0.01		+0.06		−0.01		−0.03	
Dψ δ, Dω δ	+0.3		−0.5		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Pegasi.** Mag. 3.7				**π Pegasi.** Mag. 4.4				**ζ Cephei.** Mag. 3.6				**24 Cephei.** Mag. 5.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 22 5		° ′ + 5 46		h m 22 6		° ′ +32 45		h m 22 7		° ′ +57 46		h m 22 8		° ′ +71 54	
	s		″		s		″		s		″		s		″	
Jan. 1.1	51.06	4	25.4	10	8.90	9	25.8	18	49.94	22	47.8	21	5.30	48	74.8	20
11.1	51.02	1	24.4	10	8.81	5	24.0	20	49.72	17	45.7	25	4.82	39	72.8	25
21.1	51.01	1	23.4	10	8.76	3	22.0	22	49.55	12	43.2	27	4.43	28	70.3	28
31.1	51.02	4	22.4	9	8.73	1	19.8	22	49.43	6	40.5	29	4.15	17	67.5	31
Feb. 10.0	51.06	7	21.5	7	8.74	6	17.6	22	49.37	2	37.6	30	3.98	5	64.4	32
20.0	51.13	10	20.8	5	8.80	9	15.4	20	49.39	9	34.6	29	3.93	9	61.2	31
Mar. 2.0	51.23	13	20.3	4	8.89	13	13.4	18	49.48	16	31.7	27	4.02	21	58.1	30
12.0	51.36	16	19.9	0	9.02	18	11.6	14	49.64	22	29.0	24	4.23	34	55.1	27
21.9	51.52	20	19.9	3	9.20	21	10.2	10	49.86	30	26.6	20	4.57	46	52.4	23
31.9	51.72	23	20.2	6	9.41	26	9.2	6	50.16	35	24.6	15	5.03	55	50.1	19
Apr. 10.9	51.95	26	20.8	9	9.67	29	8.6	1	50.51	41	23.1	10	5.58	64	48.2	13
20.8	52.21	29	21.7	12	9.96	31	8.5	4	50.92	44	22.1	3	6.22	70	46.9	7
30.8	52.50	30	22.9	15	10.27	33	8.9	8	51.36	47	21.8	2	6.92	74	46.2	1
May 10.8	52.80	31	24.4	17	10.60	35	9.7	13	51.83	49	22.0	8	7.66	76	46.1	5
20.8	53.11	32	26.1	19	10.95	36	11.0	18	52.32	49	22.8	14	8.42	76	46.6	11
30.7	53.43	32	28.0	21	11.31	34	12.8	21	52.81	47	24.2	19	9.18	73	47.7	17
June 9.7	53.75	31	30.1	21	11.65	34	14.9	25	53.28	45	26.1	23	9.91	68	49.4	21
19.7	54.06	29	32.2	22	11.99	31	17.4	27	53.73	41	28.4	28	10.59	62	51.5	27
29.7	54.35	27	34.4	22	12.30	28	20.1	28	54.14	37	31.2	31	11.21	54	54.2	30
July 9.6	54.62	24	36.6	21	12.58	25	22.9	30	54.51	31	34.3	34	11.75	44	57.2	33
19.6	54.86	20	38.7	19	12.83	20	25.9	30	54.82	25	37.7	35	12.19	34	60.5	36
29.6	55.06	16	40.6	18	13.03	16	28.9	30	55.07	18	41.2	36	12.53	23	64.1	37
Aug. 8.5	55.22	11	42.4	17	13.19	10	31.9	30	55.25	11	44.8	37	12.76	12	67.8	38
18.5	55.33	8	44.1	14	13.29	7	34.9	28	55.36	4	48.5	36	12.88	1	71.6	38
28.5	55.41	3	45.5	12	13.36	1	37.7	26	55.40	3	52.1	35	12.89	11	75.4	37
Sept. 7.5	55.44	1	46.7	9	13.37	3	40.3	23	55.37	10	55.6	32	12.78	21	79.1	36
17.4	55.43	4	47.6	7	13.34	7	42.6	21	55.27	15	58.8	31	12.57	32	82.7	33
27.4	55.39	7	48.3	5	13.27	11	44.7	17	55.12	21	61.9	27	12.25	40	86.0	31
Oct. 7.4	55.32	10	48.8	3	13.16	13	46.4	15	54.91	25	64.6	23	11.85	48	89.1	27
17.4	55.22	12	49.1	1	13.03	15	47.9	10	54.66	28	66.9	18	11.37	54	91.8	22
27.3	55.10	12	49.2	2	12.88	16	48.9	7	54.38	31	68.7	14	10.83	60	94.0	18
Nov. 6.3	54.98	12	49.0	3	12.72	17	49.6	2	54.07	32	70.1	9	10.23	63	95.8	12
16.3	54.86	12	48.7	5	12.55	17	49.8	1	53.75	33	71.0	3	9.60	64	97.0	6
26.2	54.74	11	48.2	6	12.38	16	49.7	6	53.42	32	71.3	2	8.96	64	97.6	1
Dec. 6.2	54.63	10	47.6	8	12.22	14	49.1	10	53.10	31	71.1	8	8.32	63	97.7	6
16.2	54.53	8	46.8	8	12.08	13	48.1	13	52.79	29	70.3	13	7.69	58	97.1	12
26.2	54.45	5	46.0	10	11.95	10	46.8	17	52.50	25	69.0	18	7.11	52	95.9	17
36.1	54.40		45.0		11.85		45.1		52.25		67.2		6.59		94.2	
Sec δ, Tan δ	1.005		+0.101		1.189		+0.644		1.876		+1.587		3.222		+3.063	
Mean Place	51^s.725		27″.89		10^s.008		21″.03		52^s.131		37″.54		9^s.412		62″.40	
$D'_\psi \alpha, D_\omega \alpha$	0.00		−0.01		−0.01		−0.04		−0.02		−0.09		−0.04		−0.18	
$D_\psi \delta, D_\omega \delta$	+0.3		−0.5		+0.3		−0.5		+0.4		−0.5		+0.4		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Aquarii.** Mag. 4.3				**α Tucanæ.** Mag. 2.9				**γ Aquarii.** Mag. 4.0				**31 Pegasi.** Mag. 4.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 12		− 8 12		22 12		−60 40		22 17		− 1 48		22 17		+11 46	
	s		″		s		″		s		″		s		″	
Jan. 1.1	17.29		48.9		36.65		96.0		12.36		79.7		16.42		17.0	
11.1	17.25	4	49.3	4	36.49	16	94.0	20	12.31	5	80.4	7	16.37	5	15.8	12
21.1	17.24	1	49.6	3	36.39	10	91.7	23	12.29	2	81.0	6	16.34	3	14.6	12
31.1	17.25	1	49.8	2	36.35	4	89.0	27	12.29	0	81.5	5	16.33	1	13.4	12
Feb. 10.0	17.29	4	49.9	1	36.38	3	86.1	29	12.33	4	81.9	4	16.35	2	12.2	12
20.0	17.36	7	49.7	2	36.47	9	83.0	31	12.39	6	82.2	3	16.41	6	11.1	11
Mar. 2.0	17.46	10	49.4	3	36.62	15	79.9	31	12.48	9	82.3	1	16.50	9	10.2	9
12.0	17.59	13	48.9	5	36.84	22	76.7	32	12.60	12	82.1	2	16.62	12	9.6	6
21.9	17.75	16	48.1	8	37.12	28	73.5	32	12.76	16	81.7	4	16.77	15	9.2	4
31.9	17.95	20	47.1	10	37.46	34	70.4	31	12.95	19	81.0	7	16.96	19	9.1	1
Apr. 10.9	18.17	22	45.9	12	37.86	40	67.5	29	13.17	22	80.1	9	17.18	22	9.4	3
20.8	18.43	26	44.5	14	38.31	45	64.8	27	13.42	25	78.9	12	17.44	26	10.1	7
30.8	18.71	28	42.9	16	38.79	48	62.4	24	13.70	28	77.5	14	17.72	28	11.1	10
May 10.8	19.01	30	41.1	18	39.32	53	60.2	22	14.00	30	75.8	17	18.02	30	12.4	13
20.8	19.33	32	39.3	18	39.87	55	58.5	17	14.31	31	74.0	18	18.33	31	14.1	17
30.7	19.65	32	37.4	19	40.43	56	57.1	14	14.63	32	72.1	19	18.65	32	16.0	19
June 9.7	19.98	33	35.4	20	40.99	56	56.2	9	14.95	32	70.1	20	18.98	33	18.0	20
19.7	20.30	32	33.5	19	41.54	55	55.8	4	15.26	31	68.1	20	19.29	31	20.3	23
29.7	20.60	30	31.8	17	42.06	52	55.8	0	15.56	30	66.1	20	19.59	30	22.6	23
July 9.6	20.87	27	30.1	17	42.54	48	56.3	5	15.84	28	64.2	19	19.86	27	24.9	23
19.6	21.12	25	28.6	15	42.97	43	57.2	9	16.09	25	62.4	18	20.11	25	27.3	24
29.6	21.34	22	27.3	13	43.34	37	58.5	13	16.30	21	60.8	16	20.31	20	29.5	22
Aug. 8.5	21.51	17	26.3	10	43.63	29	60.2	17	16.47	17	59.4	14	20.48	17	31.6	21
18.5	21.64	13	25.5	8	43.84	21	62.2	20	16.60	13	58.2	12	20.61	13	33.6	20
28.5	21.72	8	24.9	6	43.97	13	64.4	22	16.69	9	57.2	10	20.69	8	35.3	17
Sept. 7.5	21.77	5	24.5	4	44.01	4	66.7	23	16.73	4	56.4	8	20.73	4	36.9	16
17.4	21.77	0	24.3	2	43.97	4	69.1	24	16.74	1	55.9	5	20.73	0	38.2	13
27.4	21.73	4	24.3	0	43.84	13	71.4	23	16.71	3	55.6	3	20.69	4	39.2	10
Oct. 7.4	21.66	7	24.5	2	43.65	19	73.6	22	16.65	6	55.4	2	20.63	6	40.0	8
17.4	21.57	9	24.9	4	43.40	25	75.5	19	16.56	9	55.5	1	20.54	9	40.6	6
27.3	21.46	11	25.3	4	43.10	30	77.1	16	16.46	10	55.7	2	20.42	12	40.9	3
Nov. 6.3	21.34	12	25.8	5	42.77	33	78.3	12	16.34	12	56.0	3	20.30	12	41.0	1
16.3	21.22	12	26.3	5	42.43	34	79.0	7	16.22	12	56.5	5	20.18	12	40.8	2
26.2	21.10	12	26.9	6	42.10	33	79.2	2	16.10	12	57.0	5	20.05	13	40.4	4
Dec. 6.2	20.99	11	27.4	5	41.78	32	78.9	3	15.99	11	57.6	6	19.94	11	39.8	6
16.2	20.90	9	28.0	6	41.49	29	78.1	8	15.90	9	58.2	6	19.83	11	39.1	7
26.2	20.82	8	28.4	4	41.24	25	76.8	13	15.82	8	58.9	7	19.74	9	38.1	10
36.1	20.76	6	28.9	5	41.04	20	75.1	17	15.76	6	59.5	6	19.67	7	37.0	11
Sec δ, Tan δ	1.010		−0.144		2.042		−1.781		1.000		−0.032		1.021		+0.208	
Mean Place	17ˢ.793		42″.70		37ˢ.092		78″.61		12ˢ.888		75″.47		17ˢ.101		17″.28	
D′ψ α, Dω α	0.00		+0.01		+0.02		+0.11		0.00		0.00		0.00		−0.01	
Dψ δ, Dω δ	+0.4		−0.5		+0.4		−0.5		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Lacertæ. Mag. 4.6				π Aquarii. Mag. 4.6				σ Aquarii. Mag. 4.9				α Lacertæ. Mag. 3.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 22 20		° ′ +51 47		h m 22 20		° ′ + 0 56		h m 22 26		° ′ −11 6		h m 22 27		° ′ +49 50	
	s		″		s		″		s		″		s		″	
Jan. 1.2	8.86		62.5		52.56		22.8		5.45		72.6		43.23		34.3	
11.1	8.67	19	60.6	19	52.51	5	22.0	8	5.40	5	72.9	3	43.06	17	32.5	18
21.1	8.53	14	58.3	23	52.49	2	21.3	7	5.37	3	73.1	2	42.92	14	30.2	23
31.1	8.43	10	55.7	26	52.49	0	20.6	7	5.37	0	73.1	0	42.82	10	27.7	25
Feb. 10.0	8.38	5	52.9	28	52.51	2	20.0	6	5.40	3	72.9	2	42.77	5	25.1	26
20.0	8.39	1	50.1	28	52.57	6	19.6	4	5.45	5	72.6	3	42.77	0	22.4	27
Mar. 2.0	8.45	6	47.3	28	52.65	8	19.4	2	5.54	9	72.1	5	42.83	6	19.7	27
12.0	8.58	13	44.8	25	52.77	12	19.4	0	5.66	12	71.4	7	42.95	12	17.2	25
21.9	8.77	19	42.6	22	52.93	16	19.6	2	5.81	15	70.4	10	43.12	17	15.0	22
31.9	9.02	25	40.7	19	53.11	18	20.1	5	5.99	18	69.2	12	43.35	23	13.2	18
Apr. 10.9	9.33	31	39.3	14	53.33	22	20.9	8	6.21	22	67.9	13	43.64	29	11.8	14
20.9	9.68	35	38.4	9	53.58	25	22.0	11	6.46	25	66.3	16	43.97	33	10.9	9
30.8	10.07	39	38.1	3	53.85	27	23.4	14	6.73	27	64.6	17	44.34	37	10.6	3
May 10.8	10.48	41	38.3	2	54.15	30	25.0	16	7.03	30	62.7	19	44.74	40	10.8	2
20.8	10.91	43	39.1	8	54.46	31	26.7	17	7.35	32	60.8	19	45.16	42	11.6	8
30.7	11.35	44	40.5	14	54.78	32	28.7	20	7.67	32	58.8	20	45.59	43	12.9	13
June 9.7	11.79	44	42.3	18	55.10	32	30.7	20	8.00	33	56.9	19	46.01	42	14.7	18
19.7	12.20	41	44.6	23	55.41	31	32.8	21	8.32	32	55.0	19	46.42	41	16.9	22
29.7	12.59	39	47.3	27	55.71	30	34.8	20	8.63	31	53.3	17	46.81	39	19.5	26
July 9.6	12.94	35	50.3	30	55.99	28	36.8	20	8.92	29	51.7	16	47.15	34	22.5	30
19.6	13.24	30	53.5	32	56.24	25	38.7	19	9.18	26	50.3	14	47.46	31	25.7	32
29.6	13.48	24	56.9	34	56.45	21	40.5	18	9.40	22	49.1	12	47.71	25	29.0	33
Aug. 8.6	13.67	19	60.4	35	56.63	18	42.1	16	9.59	19	48.2	9	47.91	20	32.5	35
18.5	13.80	13	63.9	35	56.76	13	43.4	13	9.74	15	47.5	7	48.05	14	36.0	35
28.5	13.87	7	67.4	35	56.85	9	44.6	12	9.84	10	47.0	5	48.13	8	39.4	34
Sept. 7.5	13.88	1	70.8	34	56.90	5	45.5	9	9.89	5	46.8	2	48.16	3	42.7	33
17.4	13.83	5	73.9	31	56.91	1	46.2	7	9.90	1	46.8	0	48.13	3	45.8	31
27.4	13.73	10	76.8	29	56.88	3	46.7	5	9.88	2	47.0	2	48.05	8	48.7	29
Oct. 7.4	13.58	15	79.4	26	56.82	6	46.9	2	9.82	6	47.4	4	47.92	13	51.3	26
17.4	13.39	19	81.6	22	56.73	9	47.0	1	9.74	8	47.9	5	47.75	17	53.5	22
27.3	13.17	22	83.4	18	56.63	10	46.9	1	9.64	10	48.4	5	47.56	19	55.3	18
Nov. 6.3	12.93	24	84.8	14	56.51	12	46.7	2	9.52	12	49.0	6	47.34	22	56.7	14
16.3	12.68	25	85.7	9	56.39	12	46.3	4	9.40	12	49.6	6	47.10	24	57.6	9
26.3	12.41	27	86.0	3	56.28	11	45.8	5	9.28	12	50.2	6	46.85	25	58.0	4
Dec. 6.2	12.15	26	85.8	2	56.17	11	45.2	6	9.17	11	50.8	6	46.61	24	57.9	1
16.2	11.90	25	85.1	7	56.07	10	44.5	7	9.07	10	51.3	5	46.38	23	57.2	7
26.2	11.67	23	83.9	12	55.99	8	43.8	7	8.99	8	51.7	4	46.16	22	56.1	11
36.1	11.47	20	82.2	17	55.92	7	43.0	8	8.92	7	52.0	3	45.97	19	54.5	16
Sec δ, Tan δ	1.617		+1.271		1.000		+0.017		1.019		−0.197		1.551		+1.185	
Mean Place	$10^{s}.569$		$52''.40$		$53^{s}.100$		$26''.09$		$5^{s}.859$		$65''.96$		$44^{s}.795$		$24''.06$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		−0.08		0.00		0.00		0.00		+0.01		−0.01		−0.07	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	υ Aquarii. Mag. 5.3				226 B. Cephei. Mag. 5.7				η Aquarii. Mag. 4.1				10 Lacertæ. Mag. 4.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declin- tion N	
	h m		° ′		h m		° ′		h m		° ′		h m		°	
	22 29		−21 8		22 30		+75 46		22 30		− 0 33		22 35		+38	
	s		″		s		″		s		″		s		″	
Jan. 1.2	59.12	5	66.6	1	41.13	68	74.0	17	55.78	6	43.2	7	22.93	12	76.6	
11.1	59.07	3	66.5	4	40.45	59	72.3	22	55.72	3	43.9	7	22.81	10	74.9	
21.1	59.04	1	66.1	6	39.86	46	70.1	26	55.69	1	44.6	5	22.71	7	72.9	
31.1	59.03	2	65.5	7	39.40	31	67.5	29	55.68	2	45.1	5	22.64	3	70.7	
Feb. 10.0	59.05	6	64.8	10	39.09	16	64.6	31	55.70	5	45.6	3	22.61	2	68.4	
20.0	59.11	8	63.8	11	38.93	0	61.5	32	55.75	8	45.9	1	22.63	5	66.1	
Mar. 2.0	59.19	12	62.7	13	38.93	17	58.3	31	55.83	11	46.0	1	22.68	10	63.9	
12.0	59.31	16	61.4	15	39.10	33	55.2	28	55.94	14	45.9	3	22.78	15	61.8	
21.9	59.47	19	59.9	17	39.43	49	52.4	26	56.08	17	45.6	6	22.93	20	60.0	
31.9	59.66	22	58.2	18	39.92	62	49.8	21	56.25	21	45.0	9	23.13	24	58.6	
Apr. 10.9	59.88	25	56.4	20	40.54	74	47.7	16	56.46	25	44.1	11	23.37	28	57.6	
20.9	60.13	28	54.4	20	41.28	83	46.1	11	56.71	27	43.0	14	23.65	32	57.1	
30.8	60.41	31	52.4	20	42.11	89	45.0	5	56.98	29	41.6	17	23.97	35	57.1	
May 10.8	60.72	33	50.4	20	43.00	93	44.5	1	57.27	31	39.9	18	24.32	36	57.6	
20.8	61.05	34	48.4	20	43.93	94	44.6	8	57.58	32	38.1	19	24.68	37	58.6	
30.7	61.39	34	46.4	18	44.87	92	45.4	13	57.90	32	36.2	20	25.05	38	60.0	19
June 9.7	61.73	34	44.6	17	45.79	88	46.7	18	58.22	32	34.2	21	25.43	36	61.9	22
19.7	62.07	32	42.9	15	46.67	81	48.5	23	58.54	30	32.1	20	25.79	34	64.1	26
29.7	62.39	31	41.4	12	47.48	71	50.8	28	58.84	28	30.1	20	26.13	32	66.7	28
July 9.6	62.70	27	40.2	10	48.19	61	53.6	32	59.12	26	28.1	18	26.45	28	69.5	30
19.6	62.97	24	39.2	7	48.80	49	56.8	34	59.38	22	26.3	17	26.73	24	72.5	31
29.6	63.21	20	38.5	4	49.29	36	60.2	36	59.60	19	24.6	15	26.97	19	75.6	32
Aug. 8.6	63.41	16	38.1	1	49.65	22	63.8	38	59.79	14	23.1	13	27.16	15	78.8	31
18.5	63.57	11	38.0	2	49.87	9	67.6	38	59.93	10	21.8	11	27.31	10	81.9	31
28.5	63.68	6	38.2	4	49.96	6	71.4	38	60.03	6	20.7	9	27.41	4	85.0	29
Sept. 7.5	63.74	2	38.6	5	49.90	19	75.2	38	60.09	2	19.8	6	27.45	0	87.9	27
17.4	63.76	3	39.1	8	49.71	31	79.0	36	60.11	2	19.2	4	27.45	4	90.6	25
27.4	63.73	5	39.9	8	49.40	44	82.6	33	60.09	5	18.8	2	27.41	8	93.1	22
Oct. 7.4	63.68	9	40.7	9	48.96	55	85.9	29	60.04	8	18.6	0	27.33	12	95.3	18
17.4	63.59	11	41.6	9	48.41	64	88.8	26	59.96	10	18.6	2	27.21	14	97.1	15
27.3	63.48	12	42.5	9	47.77	71	91.4	22	59.86	11	18.8	3	27.07	16	98.6	10
Nov. 6.3	63.36	13	43.4	8	47.06	77	93.6	16	59.75	11	19.1	4	26.91	18	99.6	7
16.3	63.23	13	44.2	7	46.29	82	95.2	10	59.64	12	19.5	5	26.73	17	100.3	2
26.3	63.10	12	44.9	5	45.47	83	96.2	5	59.52	11	20.0	6	26.56	18	100.5	2
Dec. 6.2	62.98	12	45.4	3	44.64	82	96.7	2	59.41	10	20.6	6	26.38	17	100.3	7
16.2	62.86	9	45.7	2	43.82	78	96.5	8	59.31	8	21.2	7	26.21	16	99.6	11
26.2	62.77	7	45.9	1	43.04	73	95.7	13	59.23	7	21.9	7	26.05	14	98.5	15
36.1	62.70		45.8		42.31		94.4		59.16		22.6		25.91		97.0	
Sec δ, Tan δ	1.072		−0.387		4.073		+3.948		1.000		−0.010		1.280		+0.798	
Mean Place	$59^{s}.444$		$57''.19$		$46^{s}.038$		$59''.37$		$56^{s}.254$		$39''.80$		$24^{s}.036$		$68''.39$	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		+0.02		−0.04		−0.24		0.00		0.00		−0.01		−0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ε Piscis Australis.** Mag. 4.2				**ζ Pegasi.** Mag. 3.6				**β Octantis.** Mag. 4.3				**β Gruis.** Mag. 2.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 22 35		° ′ −27 29		h m 22 37		° ′ +10 22		h m 22 37		° ′ −81 49		h m 22 37		° ′ −47 19	
	s		″		s		″		s		″		s		″	
Jan. 1.2	53.83	7	44.6	4	9.79	7	55.6	10	19.35	96	77.8	25	32.09	12	80.6	12
11.1	53.76	4	44.2	7	9.72	4	54.6	11	18.39	76	75.3	30	31.97	8	79.4	16
21.1	53.72	1	43.5	9	9.68	2	53.5	11	17.63	54	72.3	33	31.89	4	77.8	20
31.1	53.71	1	42.6	11	9.66	0	52.4	11	17.09	31	69.0	36	31.85	0	75.8	22
Feb. 10.1	53.72	5	41.5	13	9.66	4	51.3	9	16.78	6	65.4	37	31.85	4	73.6	24
20.0	53.77	8	40.2	16	9.70	6	50.4	8	16.72	17	61.7	39	31.89	9	71.2	27
Mar. 2.0	53.85	11	38.6	17	9.76	10	49.6	6	16.89	41	57.8	38	31.98	14	68.5	27
12.0	53.96	16	36.9	19	9.86	14	49.0	2	17.30	63	54.0	38	32.12	18	65.8	28
21.9	54.12	19	35.0	20	10.00	18	48.8	0	17.93	84	50.2	35	32.30	22	63.0	29
31.9	54.31	22	33.0	21	10.18	20	48.8	3	18.77	104	46.7	34	32.52	28	60.1	28
Apr. 10.9	54.53	26	30.9	22	10.38	24	49.1	7	19.81	121	43.3	30	32.80	31	57.3	27
20.9	54.79	29	28.7	22	10.62	27	49.8	10	21.02	136	40.3	26	33.11	35	54.6	26
30.8	55.08	32	26.5	21	10.89	29	50.8	13	22.38	149	37.7	23	33.46	38	52.0	24
May 10.8	55.40	33	24.4	21	11.18	31	52.1	16	23.87	157	35.4	18	33.84	41	49.6	22
20.8	55.73	35	22.3	20	11.49	32	53.7	19	25.44	163	33.6	12	34.25	43	47.4	18
30.8	56.08	35	20.3	18	11.81	33	55.6	20	27.07	165	32.4	8	34.68	43	45.6	15
June 9.7	56.43	35	18.5	16	12.14	32	57.6	22	28.72	164	31.6	2	35.11	43	44.1	11
19.7	56.78	34	16.9	13	12.46	30	59.8	23	30.36	157	31.4	3	35.54	42	43.0	7
29.7	57.12	32	15.6	10	12.76	29	62.1	23	31.93	147	31.7	9	35.96	39	42.3	3
July 9.6	57.44	29	14.6	8	13.05	25	64.4	22	33.40	132	32.6	14	36.35	36	42.0	2
19.6	57.73	26	13.8	4	13.30	23	66.6	22	34.72	114	34.0	18	36.71	31	42.2	5
29.6	57.99	21	13.4	0	13.53	19	68.8	21	35.86	93	35.8	23	37.02	26	42.7	9
Aug. 8.6	58.20	17	13.4	2	13.72	14	70.9	19	36.79	68	38.1	25	37.28	20	43.6	13
18.5	58.37	11	13.6	5	13.86	11	72.8	17	37.47	41	40.6	28	37.48	14	44.9	16
28.5	58.48	8	14.1	7	13.97	6	74.5	15	37.88	13	43.4	29	37.62	8	46.5	18
Sept. 7.5	58.56	2	14.8	10	14.03	2	76.0	12	38.01	16	46.3	29	37.70	2	48.3	19
17.5	58.58	2	15.8	11	14.05	2	77.2	10	37.85	44	49.2	28	37.72	4	50.2	20
27.4	58.56	6	16.9	11	14.03	5	78.2	8	37.41	70	52.0	26	37.68	9	52.2	19
Oct. 7.4	58.50	9	18.0	12	13.98	7	79.0	6	36.71	93	54.6	23	37.59	14	54.1	19
17.4	58.41	12	19.2	11	13.91	10	79.6	3	35.78	112	56.9	19	37.45	18	56.0	16
27.3	58.29	13	20.3	11	13.81	11	79.9	1	34.66	128	58.8	14	37.27	20	57.6	14
Nov. 6.3	58.16	14	21.4	8	13.70	11	80.0	2	33.38	138	60.2	8	37.07	21	59.0	10
16.3	58.02	14	22.2	7	13.59	12	79.8	3	32.00	142	61.0	2	36.86	21	60.0	7
26.3	57.88	14	22.9	5	13.47	12	79.5	6	30.58	141	61.2	5	36.65	21	60.7	2
Dec. 6.2	57.74	12	23.4	3	13.35	10	78.9	7	29.17	135	60.7	10	36.44	19	60.9	2
16.2	57.62	10	23.7	0	13.25	9	78.2	9	27.82	124	59.7	17	36.25	17	60.7	6
26.2	57.52	9	23.7	3	13.16	8	77.3	9	26.58	109	58.0	22	36.08	14	60.1	10
36.2	57.43		23.4		13.08		76.4		25.49		55.8		35.94		59.1	
Sec δ, Tan δ	1.127		−0.520		1.017		+0.183		7.038		−6.967		1.476		−1.085	
Mean Place	$54^{s}.078$		$33''.61$		$10^{s}.351$		$55''.45$		$20^{s}.057$		$58''.63$		$32^{s}.252$		$65''.18$	
$D'_{\psi}\,\alpha$, $D_{\omega}\,\alpha$	0.00		+0.03		0.00		−0.01		+0.07		+0.44		+0.01		+0.07	
$D_{\psi}\,\delta$, $D_{\omega}\,\delta$	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Pegasi. Mag. 3.1				λ Pegasi. Mag. 4.1				ε Gruis. Mag. 3.7				τ Aquarii. Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 22 38		° ′ +29 46		h m 22 42		° ′ +23 6		h m 22 43		° ′ −51 45		h m 22 45		° ′ −14 2	
	s		″		s		″		s		″		s		″	
Jan. 1.2	57.27		21.8		22.50		50.4		21.81		85.6		2.13		55.3	
11.1	57.18	9	20.3	15	22.41	9	49.0	14	21.67	14	84.3	13	2.07	6	55.5	2
21.1	57.10	8	18.5	18	22.35	6	47.5	15	21.56	11	82.5	18	2.03	4	55.5	0
31.1	57.05	5	16.6	19	22.31	4	45.9	16	21.50	6	80.3	22	2.01	2	55.3	2
Feb. 10.1	57.03	2	14.7	19	22.30	1	44.2	17	21.49	1	77.9	24	2.02	1	55.0	3
20.0	57.05	2	12.7	20	22.32	2	42.6	16	21.52	3	75.2	27	2.05	3	54.5	5
Mar. 2.0	57.11	6	10.9	18	22.38	6	41.1	15	21.60	8	72.4	28	2.12	7	53.8	7
12.0	57.21	10	9.3	16	22.47	9	39.8	13	21.73	13	69.5	29	2.22	10	52.8	10
21.9	57.34	13	7.9	14	22.61	14	38.8	10	21.91	18	66.4	31	2.35	13	51.7	11
31.9	57.53	19	6.9	10	22.78	17	38.1	7	22.14	23	63.4	30	2.52	17	50.3	14
Apr. 10.9	57.75	22	6.3	6	22.99	21	37.8	3	22.43	29	60.4	30	2.72	20	48.8	15
20.9	58.01	26	6.1	2	23.24	25	37.9	1	22.76	33	57.6	28	2.96	24	47.1	17
30.8	58.30	29	6.4	3	23.52	28	38.4	5	23.13	37	54.9	27	3.23	27	45.2	19
May 10.8	58.62	32	7.1	7	23.82	30	39.4	10	23.53	40	52.4	25	3.52	29	43.2	20
20.8	58.95	33	8.3	12	24.14	32	40.7	13	23.97	44	50.2	22	3.83	31	41.2	20
30.8	59.30	35	9.9	16	24.47	33	42.3	16	24.42	45	48.4	18	4.15	32	39.2	20
June 9.7	59.65	35	11.8	19	24.81	34	44.3	20	24.89	47	46.9	15	4.48	33	37.2	20
19.7	59.99	34	14.1	23	25.14	33	46.5	22	25.35	46	45.8	11	4.81	33	35.3	19
29.7	60.32	33	16.6	25	25.46	32	49.0	25	25.79	44	45.2	6	5.13	32	33.6	17
July 9.6	60.62	30	19.3	27	25.75	29	51.5	25	26.21	42	45.0	2	5.43	30	32.0	16
19.6	60.89	27	22.1	28	26.02	27	54.2	27	26.60	39	45.3	3	5.71	28	30.7	13
29.6	61.13	24	24.9	28	26.26	24	56.8	26	26.94	34	46.0	7	5.95	24	29.6	11
Aug. 8.6	61.32	19	27.8	29	26.45	19	59.4	26	27.23	29	47.1	11	6.15	20	28.7	9
18.5	61.47	15	30.6	28	26.60	15	62.0	26	27.45	22	48.6	15	6.32	17	28.2	5
28.5	61.56	9	33.3	27	26.70	10	64.4	24	27.61	16	50.3	17	6.44	12	27.9	3
Sept. 7.5	61.62	6	35.8	25	26.77	7	66.5	21	27.70	9	52.3	20	6.51	7	27.8	1
17.5	61.63	1	38.1	23	26.79	2	68.5	20	27.72	2	54.4	21	6.55	4	28.0	2
27.4	61.60	3	40.2	21	26.77	2	70.2	17	27.67	5	56.6	22	6.54	1	28.4	4
Oct. 7.4	61.54	6	41.9	17	26.72	5	71.7	15	27.57	10	58.7	21	6.50	4	28.9	5
17.4	61.45	9	43.4	15	26.64	8	72.9	12	27.42	15	60.7	20	6.43	7	29.5	6
27.3	61.33	12	44.5	11	26.53	11	73.7	8	27.23	19	62.5	18	6.34	9	30.2	7
Nov. 6.3	61.20	13	45.3	8	26.42	11	74.3	6	27.01	22	64.0	15	6.23	11	31.0	8
16.3	61.05	15	45.7	4	26.29	13	74.5	2	26.77	24	65.1	11	6.11	12	31.7	7
26.3	60.90	15	45.8	1	26.15	14	74.4	1	26.52	25	65.8	7	5.99	12	32.4	7
Dec. 6.2	60.76	14	45.4	4	26.02	13	74.0	4	26.28	24	66.0	2	5.88	11	33.0	6
16.2	60.62	14	44.7	7	25.90	12	73.3	7	26.06	22	65.8	2	5.77	11	33.5	5
26.2	60.49	13	43.7	10	25.78	12	72.3	10	25.86	20	65.1	7	5.68	9	33.9	4
36.2	60.38	11	42.4	13	25.68	10	71.1	12	25.69	17	64.0	11	5.60	8	34.1	2
Sec δ, Tan δ	1.152		+0.572		1.087		+0.427		1.616		−1.269		1.031		−0.250	
Mean Place	$58^{s}.138$		15″.74		$23^{s}.222$		46″.07		$21^{s}.921$		69″.41		$2^{s}.420$		48″.28	
$D'_{\psi} a$, $D_{\omega} a$	−0.01		−0.04		0.00		−0.03		+0.01		+0.08		0.00		+0.02	
$D_{\psi} \delta$, $D_{\omega} \delta$	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**μ Pegasi.** Mag. 3.7				**ι Cephei.** Mag. 3.7				**λ Aquarii.** Mag. 3.8				**ρ Indi.** Mag. 6.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 22 45		° ′ +24 8		h m 22 46		° ′ +65 44		h m 22 48		° ′ − 8 1		h m 22 48		° ′ −70 31	
	s		″		s		″		s		″		s		″	
Jan. 1.2	50.35		54.7		34.35		66.9		7.40		80.1		41.26		79.1	
11.1	50.26	9	53.4	13	33.98	37	65.3	16	7.34	6	80.5	4	40.88	38	77.0	21
21.1	50.19	7	51.8	16	33.66	32	63.2	21	7.29	5	80.8	3	40.59	29	74.5	25
31.1	50.15	4	50.2	16	33.40	26	60.7	25	7.27	2	81.0	2	40.38	21	71.7	28
Feb. 10.1	50.13	2	48.5	17	33.22	18	57.9	28	7.28	1	81.0	0	40.26	12	68.5	32
20.0	50.15	2	46.8	17	33.12	10	54.9	30	7.31	3	80.8	2	40.24	2	65.0	35
Mar. 2.0	50.20	5	45.3	15	33.12	0	51.9	30	7.37	6	80.5	3	40.32	8	61.5	35
12.0	50.29	9	44.0	13	33.22	10	48.9	30	7.46	9	79.9	6	40.49	17	57.8	37
22.0	50.42	13	42.9	11	33.41	19	46.1	28	7.59	13	79.1	8	40.76	27	54.2	36
31.9	50.59	17	42.1	8	33.70	29	43.7	24	7.75	16	78.1	10	41.12	36	50.7	35
Apr. 10.9	50.80	21	41.8	3	34.07	37	41.7	20	7.95	20	76.8	13	41.57	45	47.3	34
20.9	51.04	24	41.8	0	34.52	45	40.2	15	8.18	23	75.3	15	42.10	53	44.2	31
30.8	51.32	28	42.3	5	35.04	52	39.2	10	8.44	26	73.7	16	42.70	60	41.3	29
May 10.8	51.63	31	43.1	8	35.60	56	38.7	5	8.73	29	71.8	19	43.36	66	38.8	25
20.8	51.95	32	44.4	13	36.19	59	38.9	2	9.04	31	69.9	19	44.07	71	36.7	21
30.8	52.29	34	46.0	16	36.80	61	39.6	7	9.35	31	67.9	20	44.82	75	35.1	16
June 9.7	52.63	34	48.0	20	37.41	61	40.9	13	9.68	33	65.9	20	45.58	76	33.9	12
19.7	52.96	33	50.2	22	38.00	59	42.8	19	10.00	32	63.9	20	46.34	76	33.3	6
29.7	53.28	32	52.6	24	38.55	55	45.1	23	10.32	32	62.0	19	47.08	74	33.1	2
July 9.7	53.58	30	55.2	26	39.05	50	47.9	28	10.61	29	60.2	18	47.78	70	33.5	4
19.6	53.85	27	57.8	26	39.49	44	50.9	30	10.88	27	58.6	16	48.42	64	34.4	9
29.6	54.09	24	60.5	27	39.86	37	54.3	34	11.12	24	57.2	14	48.98	56	35.8	14
Aug. 8.6	54.29	20	63.2	27	40.16	30	57.9	36	11.33	21	56.0	12	49.45	47	37.6	18
18.5	54.44	15	65.7	25	40.37	21	61.6	37	11.49	16	55.1	9	49.81	36	39.8	22
28.5	54.55	11	68.2	25	40.50	13	65.3	37	11.61	12	54.5	6	50.06	25	42.2	24
Sept. 7.5	54.62	7	70.4	22	40.54	4	69.1	38	11.69	8	54.1	4	50.18	12	44.9	27
17.5	54.64	2	72.4	20	40.49	5	72.7	36	11.72	3	53.9	2	50.18	0	47.6	27
27.4	54.63	1	74.2	18	40.37	12	76.1	34	11.72	0	53.9	0	50.06	12	50.3	27
Oct. 7.4	54.58	5	75.8	16	40.18	19	79.3	32	11.68	4	54.1	2	49.83	23	52.9	26
17.4	54.50	8	77.0	12	39.92	26	82.2	29	11.62	6	54.5	4	49.50	33	55.3	24
27.4	54.40	10	77.9	9	39.60	32	84.7	25	11.53	9	54.9	4	49.08	42	57.3	20
Nov. 6.3	54.28	12	78.5	6	39.23	37	86.8	21	11.43	10	55.5	6	48.60	48	58.9	16
16.3	54.15	13	78.8	3	38.83	40	88.3	15	11.32	11	56.1	6	48.08	52	60.0	11
26.3	54.02	13	78.8	0	38.41	42	89.3	10	11.20	12	56.7	6	47.53	55	60.6	6
Dec. 6.2	53.89	13	78.4	4	37.97	44	89.8	5	11.09	11	57.3	6	46.99	54	60.5	1
16.2	53.76	13	77.7	7	37.53	44	89.6	2	10.99	10	57.9	6	46.47	52	59.9	6
26.2	53.64	12	76.8	9	37.10	43	88.9	7	10.90	9	58.4	5	45.99	48	58.7	12
36.2	53.54	10	75.5	13	36.71	39	87.6	13	10.82	8	58.9	5	45.57	42	56.9	18
Sec δ, Tan δ	1.096		+0.448		2.435		+2.220		1.010		−0.141		3.001		−2.829	
Mean Place	51ˢ.069		49″.93		36ˢ.924		52″.27		7ˢ.720		75″.02		41ˢ.306		60″.44	
D′ψ a, Dω a	0.00		−0.03		−0.02		−0.14		0.00		+0.01		+0.02		+0.18	
Dψ δ, Dω δ	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Aquarii. Mag. 3.5				α Piscis Australis. Mag. 1.3				o Andromedæ. Mag. 3.6				β Pegasi. Var. 2.2–2.7			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 50		−16 16		22 52		−30 4		22 57		+41 51		22 59		+27 36	
	s		″		s		″		s		″		s		″	
Jan. 1.2	5.01		50.0		53.96		53.4		56.60		59.2		35.49		64.3	
11.1	4.94	7	50.1	1	53.87	9	53.0	4	56.45	15	57.7	15	35.39	10	63.0	13
21.1	4.89	5	50.0	1	53.81	6	52.3	7	56.32	13	55.9	18	35.30	9	61.5	15
31.1	4.87	2	49.7	3	53.78	3	51.3	10	56.22	10	53.8	21	35.24	6	59.8	17
Feb. 10.1	4.87	0	49.3	4	53.77	1	50.0	13	56.16	6	51.5	23	35.21	3	58.0	18
20.0	4.90	3	48.6	7	53.80	3	48.5	15	56.14	2	49.1	24	35.20	1	56.2	18
Mar. 2.0	4.96	6	47.7	9	53.86	6	46.8	17	56.17	3	46.8	23	35.24	4	54.5	17
12.0	5.06	10	46.6	11	53.96	10	44.9	19	56.24	7	44.6	22	35.32	8	53.0	15
22.0	5.19	13	45.4	12	54.10	14	42.9	20	56.37	13	42.6	20	35.43	11	51.8	12
31.9	5.35	16	43.9	15	54.27	17	40.7	22	56.55	18	41.0	16	35.59	16	50.8	10
Apr. 10.9	5.55	20	42.2	17	54.48	21	38.4	23	56.77	22	39.8	12	35.79	20	50.2	6
20.9	5.78	23	40.4	18	54.73	25	36.1	23	57.05	28	39.0	8	36.03	24	50.0	2
30.8	6.05	27	38.4	20	55.01	28	33.7	24	57.36	31	38.7	3	36.31	28	50.3	3
May 10.8	6.34	29	36.4	20	55.32	31	31.4	23	57.71	35	38.9	2	36.61	30	51.0	7
20.8	6.65	31	34.3	21	55.66	34	29.2	22	58.07	36	39.6	7	36.94	33	52.1	11
30.8	6.98	33	32.3	20	56.01	35	27.1	21	58.46	39	40.8	12	37.28	34	53.6	15
June 9.7	7.31	33	30.3	20	56.37	36	25.2	19	58.85	39	42.4	16	37.63	35	55.4	18
19.7	7.64	33	28.4	19	56.73	36	23.6	16	59.23	38	44.4	20	37.97	34	57.6	22
29.7	7.96	32	26.7	17	57.08	35	22.2	14	59.60	37	46.8	24	38.31	34	60.0	24
July 9.7	8.27	31	25.2	15	57.41	33	21.2	10	59.95	35	49.5	27	38.62	31	62.5	25
19.6	8.55	28	23.9	13	57.72	31	20.5	7	60.26	31	52.5	30	38.90	28	65.2	27
29.6	8.80	25	22.9	10	57.99	27	20.1	4	60.53	27	55.6	31	39.16	26	68.0	28
Aug. 8.6	9.01	21	22.2	7	58.22	23	20.1	0	60.76	23	58.7	31	39.37	21	70.7	27
18.5	9.18	17	21.7	5	58.41	19	20.4	3	60.93	17	61.9	32	39.54	17	73.4	27
28.5	9.30	12	21.5	2	58.55	14	21.0	6	61.06	13	65.1	32	39.66	12	76.0	26
Sept. 7.5	9.38	8	21.6	1	58.64	9	21.9	9	61.14	8	68.2	31	39.74	8	78.5	25
17.5	9.42	4	21.9	3	58.68	4	23.0	11	61.16	2	71.0	28	39.78	4	80.7	22
27.4	9.42	0	22.4	5	58.68	0	24.2	12	61.15	1	73.7	27	39.78	0	82.7	20
Oct. 7.4	9.38	4	23.1	7	58.63	5	25.5	13	61.09	6	76.2	25	39.74	4	84.4	17
17.4	9.31	7	23.8	7	58.55	8	26.9	14	60.99	10	78.3	21	39.67	7	85.9	15
27.4	9.22	9	24.6	8	58.44	11	28.2	13	60.86	13	80.0	17	39.58	9	87.1	12
Nov. 6.3	9.12	10	25.4	8	58.32	12	29.4	12	60.71	15	81.4	14	39.47	11	87.9	8
16.3	9.00	12	26.2	8	58.18	14	30.5	11	60.54	17	82.3	9	39.34	13	88.4	5
26.3	8.88	12	26.9	7	58.04	14	31.3	8	60.36	18	82.8	5	39.21	13	88.5	1
Dec. 6.2	8.76	12	27.6	7	57.90	14	31.9	6	60.17	19	82.9	1	39.07	14	88.3	2
16.2	8.66	10	28.1	5	57.77	13	32.2	3	59.99	18	82.5	4	38.94	13	87.7	6
26.2	8.56	10	28.4	3	57.65	12	32.2	0	59.81	18	81.6	9	38.81	13	86.9	8
36.2	8.48	8	28.6	2	57.55	10	32.0	2	59.65	16	80.3	13	38.69	12	85.7	12
Sec δ, Tan δ	1.042		−0.292		1.156		−0.579		1.343		+0.896		1.128		+0.523	
Mean Place	5ˢ.248		42″.40		54ˢ.087		42″.05		57ˢ.652		48″.77		36ˢ.192		57″.76	
D′ψ a, Dω a	0.00		+0.02		0.00		+0.04		−0.01		−0.06		0.00		−0.03	
Dψ δ, Dω δ	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**α Pegasi.** Mag. 2.6				**55 Pegasi.** Mag. 4.7				**c^2 Aquarii.** Mag. 3.8				**π Cephei.** Mag. 4.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 23 0 s		° ′ +14 44 ″		h m 23 2 s		° ′ + 8 56 ″		h m 23 4 s		° ′ −21 37 ″		h m 23 5 s		° ′ +74 55 ″	
Jan. 1.2	28.05		35.0		39.87		41.6		51.65		91.0		5.58		38.0	
11.2	27.97	8	33.9	11	39.79	8	40.7	9	51.57	8	90.9	1	4.89	69	36.7	13
21.1	27.90	7	32.8	11	39.73	6	39.7	10	51.51	6	90.6	3	4.27	62	34.9	18
31.1	27.86	4	31.6	12	39.69	4	38.7	10	51.47	4	90.1	5	3.76	51	32.6	23
Feb. 10.1	27.84	2	30.4	12	39.68	1	37.8	9	51.46	1	89.3	8	3.37	39	29.9	27
20.0	27.85	1	29.2	12	39.69	1	37.0	8	51.47	1	88.3	10	3.11	26	26.9	30
Mar. 2.0	27.89	4	28.2	10	39.73	4	36.3	7	51.52	5	87.1	12	2.99	12	23.9	30
12.0	27.96	7	27.4	8	39.80	7	35.9	4	51.60	8	85.7	14	3.04	5	20.8	31
22.0	28.08	12	26.8	6	39.91	11	35.7	2	51.71	11	84.1	16	3.24	20	17.8	30
31.9	28.23	15	26.6	2	40.06	15	35.7	0	51.86	15	82.3	18	3.59	35	15.1	27
Apr. 10.9	28.42	19	26.7	1	40.24	18	36.1	4	52.05	19	80.3	20	4.09	50	12.7	24
20.9	28.64	22	27.1	4	40.47	23	36.8	7	52.28	23	78.2	21	4.72	63	10.8	19
30.9	28.90	26	27.9	8	40.72	25	37.8	10	52.54	26	76.0	22	5.45	73	9.3	15
May 10.8	29.19	29	29.0	11	41.00	28	39.1	13	52.83	29	73.8	22	6.26	81	8.5	8
20.8	29.49	30	30.5	15	41.30	30	40.7	16	53.14	31	71.6	22	7.13	87	8.2	3
30.8	29.81	32	32.2	17	41.62	32	42.6	19	53.47	33	69.5	21	8.03	90	8.5	3
June 9.7	30.14	33	34.2	20	41.94	32	44.6	20	53.81	34	67.4	21	8.93	90	9.3	8
19.7	30.47	33	36.3	21	42.26	32	46.7	21	54.15	34	65.6	18	9.82	89	10.8	15
29.7	30.79	32	38.6	23	42.58	32	48.9	22	54.49	34	63.9	17	10.66	84	12.8	20
July 9.7	31.09	30	40.9	23	42.88	30	51.2	23	54.81	32	62.5	14	11.43	77	15.2	24
19.6	31.36	27	43.3	24	43.15	27	53.4	22	55.10	29	61.4	11	12.11	68	18.0	28
29.6	31.61	25	45.6	23	43.40	25	55.5	21	55.37	27	60.6	8	12.70	59	21.2	32
Aug. 8.6	31.81	20	47.9	23	43.61	21	57.5	20	55.60	23	60.0	6	13.18	48	24.7	35
18.6	31.98	17	50.0	21	43.78	17	59.4	19	55.78	18	59.8	2	13.53	35	28.4	37
28.5	32.11	13	52.0	20	43.90	12	61.0	16	55.93	15	59.9	1	13.76	23	32.2	38
Sept. 7.5	32.19	8	53.7	17	43.99	9	62.4	14	56.02	9	60.3	4	13.86	10	36.0	38
17.5	32.23	4	55.3	16	44.04	5	63.6	12	56.08	6	61.0	7	13.83	3	39.8	38
27.4	32.24	1	56.6	13	44.05	1	64.6	10	56.09	1	61.8	8	13.67	16	43.6	38
Oct. 7.4	32.21	3	57.6	10	44.02	3	65.3	7	56.06	3	62.7	9	13.40	27	47.1	35
17.4	32.16	5	58.4	8	43.97	5	65.8	5	56.00	6	63.7	10	13.02	38	50.3	32
27.4	32.08	8	59.0	6	43.89	8	66.1	3	55.92	8	64.8	11	12.53	49	53.2	29
Nov. 6.3	31.98	10	59.3	3	43.80	9	66.2	1	55.81	11	65.8	10	11.96	57	55.7	25
16.3	31.87	11	59.3	0	43.70	10	66.0	2	55.69	12	66.8	10	11.32	64	57.8	21
26.3	31.76	11	59.1	2	43.59	11	65.7	3	55.57	12	67.6	8	10.62	70	59.3	15
Dec. 6.3	31.64	12	58.7	4	43.48	11	65.2	5	55.45	12	68.3	7	9.88	74	60.2	9
16.2	31.53	11	58.1	6	43.37	11	64.6	6	55.33	12	68.8	5	9.13	75	60.5	3
26.2	31.42	11	57.3	8	43.28	9	63.8	8	55.22	11	69.1	3	8.39	74	60.2	3
36.2	31.33	9	56.3	10	43.19	9	63.0	8	55.13	9	69.2	1	7.67	72	59.3	9
Sec δ, Tan δ	1.034		+0.263		1.012		+0.158		1.076		−0.397		3.845		+3.713	
Mean Place	28^s.544		32″.41		40^s.280		40″.73		51^s.770		82″.18		9^s.536		20″.74	
$D'_\psi a$, $D_\omega a$	0.00		−0.02		0.00		−0.01		0.00		+0.03		−0.02		−0.24	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.3		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ι Gruis.** Mag. 4.1				**59 Pegasi.** Mag. 5.2				**5 Cassiop.** (Heis). Mag. 5.6				**φ Aquarii.** Mag. 4.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 23 5		° ′ −45 42		h m 23 7		° ′ + 8 15		h m 23 9		° ′ +56 41		h m 23 9		° ′ − 6 30	
	s		″		s		″		s		″		s		″	
Jan. 1.2	29.75		61.0		23.26		11.4		6.68		51.0		51.92		50.1	
11.2	29.62	13	60.0	10	23.18	8	10.5	9	6.43	25	49.6	14	51.84	8	50.6	5
21.1	29.51	11	58.6	14	23.12	6	9.6	9	6.21	22	47.7	19	51.78	6	51.0	4
31.1	29.43	8	56.9	17	23.08	4	8.7	9	6.03	18	45.5	22	51.74	4	51.2	2
Feb. 10.1	29.39	4	54.8	21	23.06	2	7.8	9	5.89	14	43.0	25	51.72	2	51.3	1
20.0	29.39	0	52.5	23	23.06	0	7.1	7	5.82	7	40.3	27	51.73	1	51.2	1
Mar. 2.0	29.43	4	49.9	26	23.10	4	6.4	7	5.81	1	37.5	28	51.77	4	50.9	3
12.0	29.52	9	47.2	27	23.17	7	6.0	4	5.87	6	34.8	27	51.84	7	50.4	5
22.0	29.66	14	44.4	28	23.28	11	5.9	1	6.00	13	32.3	25	51.95	11	49.7	7
31.9	29.84	18	41.4	30	23.42	14	6.0	1	6.21	21	30.0	23	52.09	14	48.7	10
Apr. 10.9	30.07	23	38.5	29	23.60	18	6.4	4	6.48	27	28.1	19	52.27	18	47.5	12
20.9	30.34	27	35.6	29	23.81	21	7.1	7	6.82	34	26.7	14	52.48	21	46.1	14
30.9	30.65	31	32.8	28	24.06	25	8.2	11	7.21	39	25.8	9	52.72	24	44.5	16
May 10.8	31.00	35	30.2	26	24.34	28	9.5	13	7.65	44	25.4	4	53.00	28	42.7	18
20.8	31.38	38	27.8	24	24.64	30	11.1	16	8.12	47	25.6	2	53.30	30	40.7	20
30.8	31.79	41	25.7	21	24.96	32	12.9	18	8.61	49	26.3	7	53.61	31	38.7	20
June 9.7	32.21	42	23.9	18	25.28	32	14.9	20	9.10	49	27.5	12	53.93	32	36.6	21
19.7	32.63	42	22.4	15	25.60	32	17.0	21	9.59	49	29.3	18	54.26	33	34.6	20
29.7	33.04	41	21.4	10	25.92	32	19.3	23	10.06	47	31.5	22	54.58	32	32.6	20
July 9.7	33.43	39	20.8	6	26.22	30	21.5	22	10.50	44	34.1	26	54.88	30	30.7	19
19.6	33.80	37	20.6	2	26.50	28	23.7	22	10.90	40	37.0	29	55.16	28	29.0	17
29.6	34.13	33	20.9	3	26.75	25	25.8	21	11.25	35	40.2	32	55.42	26	27.5	15
Aug. 8.6	34.41	28	21.6	7	26.96	21	27.7	19	11.55	30	43.6	34	55.63	21	26.2	13
18.6	34.65	24	22.6	10	27.13	17	29.5	18	11.78	23	47.1	35	55.81	18	25.2	10
28.5	34.82	17	24.0	14	27.27	14	31.1	16	11.95	17	50.7	36	55.96	15	24.4	8
Sept. 7.5	34.93	11	25.7	17	27.36	9	32.5	14	12.05	10	54.3	36	56.05	9	23.9	5
17.5	34.99	6	27.6	19	27.41	5	33.7	12	12.09	4	57.7	34	56.11	6	23.7	2
27.4	34.98	1	29.6	20	27.42	1	34.6	9	12.07	2	61.0	33	56.13	2	23.6	1
Oct. 7.4	34.92	6	31.6	20	27.40	2	35.3	7	11.99	8	64.1	31	56.11	2	23.7	1
17.4	34.82	10	33.6	20	27.36	4	35.8	5	11.86	13	66.9	28	56.07	4	24.0	3
27.4	34.68	14	35.4	18	27.29	7	36.0	2	11.68	18	69.3	24	56.00	7	24.5	5
Nov. 6.3	34.51	17	37.0	16	27.20	9	36.1	1	11.47	21	71.3	20	55.91	9	25.0	5
16.3	34.32	19	38.3	13	27.10	10	36.0	1	11.23	24	72.8	15	55.81	10	25.6	6
26.3	34.12	20	39.2	9	26.99	11	35.6	4	10.96	27	73.9	11	55.70	11	26.3	7
Dec. 6.3	33.92	20	39.8	6	26.88	11	35.1	5	10.68	28	74.4	5	55.59	11	26.9	6
16.2	33.72	20	39.9	1	26.77	11	34.5	6	10.40	28	74.4	0	55.49	10	27.5	6
26.2	33.55	17	39.6	3	26.67	10	33.8	7	10.12	28	73.8	6	55.39	10	28.1	6
36.2	33.39	16	38.9	7	26.59	8	32.9	9	9.85	27	72.7	11	55.31	8	28.6	5
Sec δ, Tan δ	1.432		−1.025		1.011		+0.145		1.822		+1.522		1.007		−0.114	
Mean Place	29ˢ.702		46″.05		23ˢ.637		10″.60		8ˢ.260		36″.42		52ˢ.128		46″.19	
D′ψ α, Dω α	+0.01		+0.07		0.00		−0.01		−0.01		−0.10		0.00		+0.01	
Dψ δ, Dω δ	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ψ Aquarii. Mag. 4.5				γ Tucanæ. Mag. 4.1				γ Piscium. Mag. 3.8				γ Sculptoris. Mag. 4.5			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 11		− 9 33		23 12		−58 41		23 12		+ 2 48		23 14		−32 59	
	s		″		s		″		s		″		s		″	
Jan. 1.2	23.05	7	27.6	4	25.21	23	105.0	14	42.12	8	43.3	8	10.97	10	74.4	5
11.2	22.98	6	28.0	2	24.98	19	103.6	19	42.04	6	42.5	7	10.87	9	73.9	7
21.1	22.92	4	28.2	1	24.79	15	101.7	23	41.98	5	41.8	7	10.78	6	73.2	11
31.1	22.88	2	28.3	1	24.64	9	99.4	26	41.93	2	41.1	5	10.72	3	72.1	14
Feb. 10.1	22.86	1	28.2	2	24.55	4	96.8	29	41.91	1	40.6	5	10.69	0	70.7	16
20.1	22.87	4	28.0	5	24.51	2	93.9	31	41.92	3	40.1	3	10.69	4	69.1	18
Mar. 2.0	22.91	7	27.5	7	24.53	8	90.8	33	41.95	7	39.8	1	10.73	7	67.3	21
12.0	22.98	10	26.8	9	24.61	14	87.5	34	42.02	10	39.7	2	10.80	11	65.2	23
22.0	23.08	14	25.9	11	24.75	21	84.1	34	42.12	14	39.9	4	10.91	15	62.9	24
31.9	23.22	18	24.8	14	24.96	27	80.7	33	42.26	18	40.3	7	11.06	19	60.5	25
Apr. 10.9	23.40	21	23.4	16	25.23	32	77.4	32	42.44	21	41.0	10	11.25	23	58.0	25
20.9	23.61	25	21.8	17	25.55	38	74.2	30	42.65	24	42.0	13	11.48	27	55.5	26
30.9	23.86	27	20.1	19	25.93	43	71.2	28	42.89	28	43.3	15	11.75	30	52.9	25
May 10.8	24.13	30	18.2	21	26.36	47	68.4	25	43.17	29	44.8	17	12.05	33	50.4	24
20.8	24.43	32	16.1	20	26.83	50	65.9	21	43.46	32	46.5	19	12.38	35	48.0	22
30.8	24.75	32	14.1	21	27.33	52	63.8	17	43.78	32	48.4	21	12.73	36	45.8	20
June 9.8	25.07	33	12.0	21	27.85	52	62.1	12	44.10	33	50.5	21	13.09	37	43.8	18
19.7	25.40	32	9.9	19	28.37	52	60.9	7	44.43	32	52.6	21	13.46	36	42.0	14
29.7	25.72	31	8.0	18	28.89	50	60.2	3	44.75	30	54.7	21	13.82	35	40.6	11
July 9.7	26.03	29	6.2	16	29.39	47	59.9	2	45.05	28	56.8	20	14.17	32	39.5	8
19.6	26.32	26	4.6	14	29.86	42	60.1	8	45.33	25	58.8	20	14.49	30	38.7	3
29.6	26.58	22	3.2	11	30.28	36	60.9	12	45.58	22	60.8	17	14.79	25	38.4	0
Aug. 8.6	26.80	18	2.1	9	30.64	29	62.1	15	45.80	18	62.5	15	15.04	21	38.4	4
18.6	26.98	15	1.2	6	30.93	22	63.6	20	45.98	14	64.0	13	15.25	17	38.8	7
28.5	27.13	10	0.6	3	31.15	14	65.6	22	46.12	10	65.3	11	15.42	11	39.5	10
Sept. 7.5	27.23	6	0.3	2	31.29	7	67.8	24	46.22	6	66.4	9	15.53	6	40.5	12
17.5	27.29	2	0.1	2	31.36	2	70.2	25	46.28	2	67.3	6	15.59	2	41.7	15
27.5	27.31	2	0.3	3	31.34	9	72.7	24	46.30	1	67.9	4	15.61	3	43.2	15
Oct. 7.4	27.29	4	0.6	5	31.25	15	75.1	24	46.29	4	68.3	1	15.58	6	44.7	15
17.4	27.25	7	1.1	5	31.10	21	77.5	21	46.25	6	68.4	0	15.52	10	46.2	16
27.4	27.18	9	1.6	7	30.89	26	79.6	18	46.19	8	68.4	1	15.42	12	47.8	14
Nov. 6.3	27.09	10	2.3	7	30.63	28	81.4	14	46.11	10	68.3	3	15.30	14	49.2	12
16.3	26.99	11	3.0	7	30.35	31	82.8	10	46.01	10	68.0	5	15.16	14	50.4	10
26.3	26.88	11	3.7	6	30.04	31	83.8	5	45.91	11	67.5	5	15.02	15	51.4	7
Dec. 6.3	26.77	10	4.3	6	29.73	30	84.3	1	45.80	10	67.0	7	14.87	15	52.1	4
16.2	26.67	10	4.9	6	29.43	29	84.2	6	45.70	9	66.3	7	14.72	13	52.5	1
26.2	26.57	9	5.5	4	29.14	25	83.6	11	45.61	9	65.6	7	14.59	12	52.6	2
36.2	26.48		5.9		28.89		82.5		45.52		64.9		14.47		52.4	
Sec δ, Tan δ	1.014		−0.168		1.925		−1.645		1.001		+0.049		1.192		−0.649	
Mean Place	23ˢ.232		22″.76		24ˢ.994		87″.79		42ˢ.403		44″.02		10ˢ.950		62″.63	
D′ψ α, Dω α	0.00		+0.01		+0.01		+0.11		0.00		0.00		0.00		+0.04	
Dψ δ, Dω δ	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ο Cephei. Mag. 4.9				τ Pegasi. Mag. 4.6				b^1 Aquarii. Mag. 4.2				4 Cassiopeiæ. Mag. 5.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 23 15		° ′ +67 38		h m 23 16		° ′ +23 15		h m 23 18		° ′ −20 33		h m 23 20		° ′ +61 48	
	s		″		s		″		s		″		s		″	
Jan. 1.2	2.89		44.0		22.16		76.0		27.26		81.1		58.85		54.3	
11.2	2.45	44	42.7	13	22.06	10	74.8	12	27.17	9	81.1	0	58.52	33	53.1	12
21.1	2.06	39	40.9	18	21.97	9	73.5	13	27.10	7	80.9	2	58.22	30	51.3	18
31.1	1.72	34	38.7	22	21.90	7	72.0	15	27.05	5	80.4	5	57.97	25	49.2	21
Feb. 10.1	1.46	26	36.1	26	21.86	4	70.5	15	27.02	3	79.7	7	57.77	20	46.7	25
20.1	1.29	17	33.3	28	21.85	1	68.9	16	27.02	0	78.8	9	57.64	13	43.9	28
Mar. 2.0	1.22	7	30.3	30	21.87	2	67.5	14	27.05	3	77.7	11	57.59	5	41.1	28
12.0	1.25	3	27.3	30	21.93	6	66.2	13	27.11	6	76.3	14	57.61	2	38.2	29
22.0	1.39	14	24.5	28	22.02	9	65.2	10	27.21	10	74.8	15	57.72	11	35.5	27
31.9	1.63	24	21.9	26	22.16	14	64.4	8	27.35	14	73.0	18	57.92	20	33.0	25
Apr. 10.9	1.97	34	19.6	23	22.34	18	64.0	4	27.52	17	71.1	19	58.20	28	30.9	21
20.9	2.40	43	17.8	18	22.56	22	64.0	0	27.73	21	69.0	21	58.56	36	29.2	17
30.9	2.91	51	16.4	14	22.82	26	64.3	3	27.98	25	66.8	22	58.98	42	28.0	12
May 10.8	3.49	58	15.6	8	23.11	29	65.1	8	28.26	28	64.6	22	59.45	47	27.3	7
20.8	4.11	62	15.4	2	23.42	31	66.2	11	28.56	30	62.3	23	59.97	52	27.2	1
30.8	4.76	65	15.8	4	23.75	33	67.7	15	28.88	32	60.1	22	60.51	54	27.6	4
June 9.8	5.42	66	16.7	9	24.09	34	69.5	18	29.22	34	58.0	21	61.06	55	28.6	10
19.7	6.07	65	18.2	15	24.43	34	71.6	21	29.56	34	56.1	19	61.61	55	30.1	15
29.7	6.69	62	20.1	19	24.76	33	73.9	23	29.90	34	54.3	18	62.14	53	32.1	20
July 9.7	7.27	58	22.6	25	25.08	32	76.3	24	30.22	32	52.8	15	62.64	50	34.6	25
19.6	7.79	52	25.4	28	25.37	29	78.8	25	30.52	30	51.6	12	63.09	45	37.4	28
29.6	8.25	46	28.6	32	25.63	26	81.4	26	30.79	27	50.6	10	63.49	40	40.5	31
Aug. 8.6	8.63	38	32.0	34	25.85	22	84.0	26	31.03	24	50.0	6	63.83	34	43.9	34
18.6	8.93	30	35.6	36	26.04	19	86.5	25	31.23	20	49.7	3	64.10	27	47.4	35
28.5	9.14	21	39.3	37	26.18	14	88.9	24	31.38	15	49.7	0	64.30	20	51.1	37
Sept. 7.5	9.26	12	43.1	38	26.28	10	91.1	22	31.49	11	50.0	3	64.43	13	54.7	36
17.5	9.30	4	46.8	37	26.34	6	93.1	20	31.56	7	50.6	6	64.48	5	58.3	36
27.5	9.24	6	50.4	36	26.36	2	94.9	18	31.58	2	51.4	8	64.46	2	61.8	35
Oct. 7.4	9.11	13	53.8	34	26.34	2	96.5	16	31.57	1	52.3	9	64.38	8	65.0	32
17.4	8.89	22	57.0	32	26.30	4	97.8	13	31.52	5	53.3	10	64.23	15	68.0	30
27.4	8.61	28	59.8	28	26.23	7	98.8	10	31.45	7	54.4	11	64.03	20	70.7	27
Nov. 6.3	8.27	34	62.2	24	26.13	10	99.5	7	31.35	10	55.4	10	63.79	24	73.0	23
16.3	7.88	39	64.2	20	26.02	11	99.9	4	31.25	10	56.4	10	63.50	29	74.9	19
26.3	7.45	43	65.6	14	25.90	12	100.0	1	31.13	12	57.3	9	63.18	32	76.2	13
Dec. 6.3	6.99	46	66.5	9	25.78	12	99.8	2	31.01	12	58.1	8	62.84	34	77.0	8
16.2	6.52	47	66.7	2	25.66	12	99.3	5	30.89	12	58.7	6	62.48	36	77.2	2
26.2	6.05	47	66.4	3	25.54	12	98.5	8	30.78	11	59.0	3	62.13	35	76.9	3
36.2	5.60	45	65.5	9	25.43	11	97.5	10	30.68	10	59.2	2	61.79	34	75.9	10
Sec δ, Tan δ	2.630		+2.432		1.089		+0.430		1.068		−0.375		2.117		+1.867	
Mean Place	$5^{s}.314$		27″.02		$22^{s}.688$		69″.84		$27^{s}.302$		72″.95		$60^{s}.640$		37″.95	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		−0.16		0.00		−0.03		0.00		+0.02		−0.01		−0.12	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**υ Pegasi.** Mag. 4.6				**κ Piscium.** Mag. 4.9				**θ Piscium.** Mag. 4.4				**70 Pegasi.** Mag. 4.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 21		+22 55		23 22		+ 0 47		23 23		+ 5 54		23 24		+12 17	
	s		″		s		″		s		″		s		″	
Jan. 1.2	4.60	10	55.8	11	31.22	8	4.0	7	36.03	8	24.2	8	47.92	9	12.5	9
11.2	4.50	9	54.7	13	31.14	7	3.3	6	35.95	7	23.4	8	47.83	8	11.6	10
21.1	4.41	7	53.4	15	31.07	5	2.7	6	35.88	6	22.6	8	47.75	6	10.6	11
31.1	4.34	5	51.9	15	31.02	3	2.1	5	35.82	3	21.8	7	47.69	4	9.5	10
Feb. 10.1	4.29	1	50.4	15	30.99	0	1.6	3	35.79	1	21.1	6	47.65	1	8.5	10
20.1	4.28	1	48.9	14	30.99	2	1.3	2	35.78	2	20.5	5	47.64	2	7.5	8
Mar. 2.0	4.29	6	47.5	12	31.01	6	1.1	1	35.80	5	20.0	2	47.66	5	6.7	6
12.0	4.35	9	46.3	10	31.07	9	1.2	3	35.85	9	19.8	0	47.71	9	6.1	4
22.0	4.44	13	45.3	8	31.16	13	1.5	5	35.94	13	19.8	2	47.80	13	5.7	2
31.9	4.57	18	44.5	4	31.29	16	2.0	8	36.07	17	20.0	5	47.93	16	5.5	2
Apr. 10.9	4.75	22	44.1	0	31.45	20	2.8	11	36.24	20	20.5	9	48.09	20	5.7	5
20.9	4.97	25	44.1	3	31.65	24	3.9	13	36.44	24	21.4	11	48.29	24	6.2	8
30.9	5.22	28	44.4	8	31.89	26	5.2	16	36.68	26	22.5	14	48.53	27	7.0	12
May 10.8	5.50	31	45.2	11	32.15	30	6.8	18	36.94	29	23.9	16	48.80	30	8.2	14
20.8	5.81	33	46.3	15	32.45	31	8.6	19	37.23	31	25.5	18	49.10	31	9.6	17
30.8	6.14	34	47.8	18	32.76	32	10.5	21	37.54	32	27.3	20	49.41	33	11.3	19
June 9.8	6.48	35	49.6	20	33.08	32	12.6	21	37.86	33	29.3	21	49.74	33	13.2	21
19.7	6.83	33	51.6	23	33.40	32	14.7	21	38.19	32	31.4	22	50.07	32	15.3	22
29.7	7.16	32	53.9	24	33.72	31	16.8	20	38.51	31	33.6	21	50.39	31	17.5	23
July 9.7	7.48	29	56.3	25	34.03	28	18.8	20	38.82	28	35.7	21	50.70	29	19.8	23
19.6	7.77	27	58.8	26	34.31	26	20.8	18	39.10	26	37.8	20	50.99	26	22.1	22
29.6	8.04	22	61.4	25	34.57	23	22.6	17	39.36	23	39.8	19	51.25	23	24.3	22
Aug. 8.6	8.26	19	63.9	25	34.80	19	24.3	14	39.59	18	41.7	17	51.48	19	26.5	20
18.6	8.45	15	66.4	24	34.99	15	25.7	12	39.77	15	43.4	15	51.67	15	28.5	18
28.5	8.60	11	68.8	22	35.14	10	26.9	10	39.92	11	44.9	13	51.82	11	30.3	16
Sept. 7.5	8.71	6	71.0	20	35.24	7	27.9	7	40.03	7	46.2	10	51.93	7	31.9	14
17.5	8.77	3	73.0	18	35.31	3	28.6	5	40.10	3	47.2	8	52.00	3	33.3	12
27.5	8.80	1	74.8	15	35.34	0	29.1	3	40.13	0	48.0	6	52.03	0	34.5	10
Oct. 7.4	8.79	4	76.3	13	35.34	3	29.4	0	40.13	3	48.6	3	52.03	4	35.5	7
17.4	8.75	7	77.6	10	35.31	6	29.4	1	40.10	6	48.9	2	51.99	6	36.2	4
27.4	8.68	9	78.6	7	35.25	8	29.3	2	40.04	8	49.1	1	51.93	8	36.6	3
Nov. 6.3	8.59	11	79.3	4	35.17	9	29.1	4	39.96	9	49.0	2	51.85	9	36.9	0
16.3	8.48	11	79.7	1	35.08	10	28.7	5	39.87	10	48.8	3	51.76	10	36.9	2
26.3	8.37	12	79.8	1	34.98	10	28.2	6	39.77	11	48.5	5	51.66	10	36.7	3
Dec. 6.3	8.25	13	79.7	5	34.88	10	27.6	6	39.66	10	48.0	6	51.56	11	36.4	6
16.2	8.12	11	79.2	8	34.78	10	27.0	7	39.56	10	47.4	7	51.45	11	35.8	7
26.2	8.01	11	78.4	9	34.68	9	26.3	7	39.46	9	46.7	8	51.34	10	35.1	9
36.2	7.90		77.5		34.59		25.6		39.37		45.9		51.24		34.2	
Sec δ, Tan δ	1.086		+0.423		1.000		+0.014		1.005		+0.104		1.024		+0.218	
Mean Place	5ˢ.095		49″.56		31ˢ.433		5″.01		36ˢ.292		23″.49		48ˢ.242		9″.56	
D′ψ α, Dω α	0.00		−0.03		0.00		0.00		0.00		−0.01		0.00		−0.01	
Dψ δ, Dω δ	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**β Sculptoris.** Mag. 4.5				**72 Pegasi** (*mean*). Mag. 5.2				**λ Andromedæ.** Mag. 4.0				**ι Andromedæ.** Mag. 4.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 28		−38 17		23 29		+30 50		23 33		+45 59		23 33		+42 47	
	s		″		s		″		s		″		s		″	
Jan. 1.2	21.95	13	51.8	5	40.44	12	71.4	11	20.14	19	45.4	12	54.05	17	43.6	12
11.2	21.82	11	51.3	9	40.32	11	70.3	14	19.95	17	44.2	16	53.88	15	42.4	15
21.1	21.71	8	50.4	13	40.21	9	68.9	17	19.78	14	42.6	19	53.73	13	40.9	18
31.1	21.63	6	49.1	16	40.12	7	67.2	17	19.64	12	40.7	22	53.60	10	39.1	21
Feb. 10.1	21.57	2	47.5	19	40.05	4	65.5	18	19.52	7	38.5	23	53.50	7	37.0	22
20.1	21.55	1	45.6	21	40.01	0	63.7	18	19.45	2	36.2	24	53.43	2	34.8	23
Mar. 2.0	21.56	5	43.5	24	40.01	4	61.9	16	19.43	3	33.8	23	53.41	3	32.5	22
12.0	21.61	10	41.1	25	40.05	9	60.3	15	19.46	8	31.5	22	53.44	8	30.3	20
22.0	21.71	13	38.6	27	40.14	13	58.8	12	19.54	14	29.3	20	53.52	13	28.3	18
Apr. 1.0	21.84	18	35.9	28	40.27	17	57.6	8	19.68	19	27.3	16	53.65	19	26.5	14
10.9	22.02	23	33.1	28	40.44	22	56.8	5	19.87	26	25.7	12	53.84	24	25.1	11
20.9	22.25	26	30.3	27	40.66	26	56.3	1	20.13	30	24.5	7	54.08	29	24.0	6
30.9	22.51	31	27.6	27	40.92	30	56.2	4	20.43	34	23.8	3	54.37	33	23.4	1
May 10.8	22.82	33	24.9	26	41.22	32	56.6	8	20.77	38	23.5	3	54.70	36	23.3	3
20.8	23.15	36	22.3	23	41.54	34	57.4	12	21.15	40	23.8	7	55.06	39	23.6	9
30.8	23.51	38	20.0	21	41.88	36	58.6	16	21.55	41	24.5	12	55.45	39	24.5	13
June 9.8	23.89	38	17.9	18	42.24	36	60.2	19	21.96	41	25.7	17	55.84	40	25.8	17
19.7	24.27	38	16.1	14	42.60	35	62.1	22	22.37	41	27.4	21	56.24	39	27.5	21
29.7	24.65	37	14.7	11	42.95	33	64.3	25	22.78	39	29.5	24	56.63	37	29.6	24
July 9.7	25.02	35	13.6	6	43.28	32	66.8	26	23.17	35	31.9	27	57.00	35	32.0	27
19.7	25.37	32	13.0	3	43.60	28	69.4	27	23.52	33	34.6	29	57.35	31	34.7	29
29.6	25.69	28	12.7	2	43.88	24	72.1	28	23.85	28	37.5	31	57.66	27	37.6	31
Aug. 8.6	25.97	23	12.9	6	44.12	20	74.9	28	24.13	23	40.6	32	57.93	23	40.7	31
18.6	26.20	19	13.5	9	44.32	16	77.7	27	24.36	18	43.8	32	58.16	18	43.8	31
28.5	26.39	13	14.4	13	44.48	12	80.4	25	24.54	13	47.0	32	58.34	13	46.9	31
Sept. 7.5	26.52	8	15.7	15	44.60	8	82.9	25	24.67	8	50.2	31	58.47	8	50.0	30
17.5	26.60	3	17.2	17	44.68	3	85.4	22	24.75	3	53.3	29	58.55	3	53.0	27
27.5	26.63	2	18.9	18	44.71	1	87.6	20	24.78	1	56.2	27	58.58	1	55.7	26
Oct. 7.4	26.61	5	20.7	18	44.70	4	89.6	17	24.77	6	58.9	25	58.57	5	58.3	23
17.4	26.56	10	22.5	18	44.66	7	91.3	14	24.71	10	61.4	21	58.52	9	60.6	20
27.4	26.46	13	24.3	16	44.59	9	92.7	11	24.61	12	63.5	18	58.43	12	62.6	17
Nov. 6.4	26.33	14	25.9	14	44.50	11	93.8	8	24.49	16	65.3	13	58.31	14	64.3	13
16.3	26.19	16	27.3	12	44.39	13	94.6	4	24.33	17	66.6	10	58.17	16	65.6	8
26.3	26.03	17	28.5	8	44.26	13	95.0	0	24.16	19	67.6	4	58.01	17	66.4	4
Dec. 6.3	25.86	16	29.3	5	44.13	14	95.0	3	23.97	20	68.0	1	57.84	18	66.8	0
16.2	25.70	16	29.8	1	43.99	14	94.7	6	23.77	20	68.1	5	57.66	18	66.8	5
26.2	25.54	14	29.9	3	43.85	13	94.1	10	23.57	19	67.6	9	57.48	18	66.3	9
36.2	25.40		29.6		43.72		93.1		23.38		66.7		57.30		65.4	
Sec δ, Tan δ	1.274		−0.789		1.165		+0.597		1.440		+1.036		1.363		+0.926	
Mean Place	$21^{s}.782$		$38''.99$		$41^{s}.016$		$62''.28$		$21^{s}.044$		$31''.74$		$54^{s}.862$		$30''.82$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		+0.05		0.00		−0.04		0.00		−0.07		0.00		−0.06	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.1		+0.4		−0.1		+0.4		−0.1		+0.4		−0.1	

[Eph 14]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ι Piscium.** Mag. 4.3				**γ Cephei.** Mag. 3.4				**κ Andromedæ.** Mag. 4.3				**ω² Aquarii.** Mag. 4.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 23 35 s		° ′ + 5 9 ″		h m 23 35 s		° ′ +77 8 ″		h m 23 36 s		° ′ +43 51 ″		h m 23 38 s		° ′ −15 0 ″	
Jan. 1.2	31.39		37.2		44.61		88.0		9.27		40.6		15.83		79.2	
11.2	31.30	9	36.5	7	43.76	85	87.2	8	9.10	17	39.5	11	15.74	9	79.5	3
21.1	31.22	8	35.7	8	42.97	79	85.8	14	8.94	16	37.9	16	15.66	8	79.5	0
31.1	31.16	6	35.0	7	42.27	70	83.8	20	8.80	14	36.1	18	15.60	6	79.4	1
Feb. 10.1	31.12	4	34.3	7	41.69	58	81.4	24	8.69	11	34.0	21	15.55	5	79.0	4
20.1	31.10	2	33.7	6	41.26	43	78.7	27	8.62	7	31.8	22	15.53	2	78.5	5
Mar. 2.0	31.11	1	33.3	4	41.00	26	75.8	29	8.59	3	29.5	23	15.54	1	77.7	8
12.0	31.15	4	33.1	2	40.91	9	72.7	31	8.62	3	27.2	23	15.58	4	76.6	11
22.0	31.23	8	33.1	0	41.01	10	69.7	30	8.70	8	25.1	21	15.66	8	75.4	12
Apr. 1.0	31.35	12	33.4	3	41.30	29	66.8	29	8.83	13	23.3	18	15.77	11	73.9	15
10.9	31.51	16	33.9	5	41.76	46	64.2	26	9.02	19	21.8	15	15.92	15	72.2	17
20.9	31.70	19	34.8	9	42.38	62	61.9	23	9.26	24	20.7	11	16.11	19	70.3	19
30.9	31.93	23	35.9	11	43.14	76	60.2	17	9.55	29	20.0	7	16.34	23	68.3	20
May 10.8	32.19	26	37.3	14	44.02	88	58.9	13	9.88	33	19.8	2	16.60	26	66.2	21
20.8	32.47	28	38.9	16	44.99	97	58.1	8	10.25	37	20.1	3	16.89	29	64.0	22
30.8	32.78	31	40.7	18	46.01	102	58.0	1	10.64	39	20.9	8	17.20	31	61.8	22
June 9.8	33.10	32	42.7	20	47.06	105	58.4	4	11.04	40	22.2	13	17.52	32	59.6	22
19.7	33.43	33	44.8	21	48.11	105	59.4	10	11.44	40	23.9	17	17.86	34	57.5	21
29.7	33.75	32	46.9	21	49.13	102	61.0	16	11.84	40	25.9	20	18.19	33	55.6	19
July 9.7	34.06	31	49.0	21	50.09	96	63.0	20	12.22	38	28.3	24	18.51	32	53.8	18
19.7	34.35	29	51.1	21	50.97	88	65.6	26	12.57	35	31.0	27	18.81	30	52.3	15
29.6	34.62	27	53.1	20	51.75	78	68.5	29	12.89	32	33.9	29	19.09	28	51.1	12
Aug. 8.6	34.85	23	54.9	18	52.41	66	71.7	32	13.17	28	37.0	31	19.34	25	50.1	10
18.6	35.05	20	56.6	17	52.95	54	75.2	35	13.40	23	40.1	31	19.54	20	49.5	6
28.5	35.21	16	58.0	14	53.35	40	78.9	37	13.58	18	43.3	32	19.71	17	49.2	3
Sept. 7.5	35.34	13	59.2	12	53.60	25	82.7	38	13.71	13	46.4	31	19.84	13	49.1	1
17.5	35.42	8	60.2	10	53.71	11	86.6	39	13.79	8	49.4	30	19.93	9	49.3	2
27.5	35.46	4	61.0	8	53.67	4	90.5	39	13.83	4	52.2	28	19.97	4	49.8	5
Oct. 7.4	35.47	1	61.5	5	53.49	18	94.2	37	13.82	1	54.9	27	19.98	1	50.4	6
17.4	35.45	2	61.8	3	53.18	31	97.7	35	13.77	5	57.2	23	19.96	2	51.2	8
27.4	35.41	4	61.9	1	52.73	45	100.9	32	13.68	9	59.3	21	19.91	5	52.1	9
Nov. 6.4	35.34	7	61.8	1	52.17	56	103.8	29	13.57	11	61.0	17	19.83	8	53.1	10
16.3	35.26	8	61.6	2	51.50	67	106.2	24	13.42	15	62.3	13	19.74	9	54.0	9
26.3	35.16	10	61.2	4	50.74	76	108.2	20	13.26	16	63.2	9	19.64	10	54.9	9
Dec. 6.3	35.06	10	60.7	5	49.92	82	109.6	14	13.09	17	63.7	5	19.53	11	55.7	8
16.2	34.96	10	60.1	6	49.06	86	110.4	8	12.90	19	63.7	0	19.42	11	56.4	7
26.2	34.86	10	59.4	7	48.18	88	110.5	1	12.71	19	63.3	4	19.31	11	56.9	5
36.2	34.77	9	58.6	8	47.30	88	110.1	4	12.53	18	62.4	9	19.21	10	57.2	3
Sec δ, Tan δ	1.004		+0.090		4.499		+4.386		1.387		+0.961		1.035		−0.268	
Mean Place	$31^{s}.572$		$36''.29$		$48^{s}.541$		$68''.55$		$10^{s}.691$		$27''.40$		$15^{s}.805$		$73''.44$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.01		−0.01		−0.29		0.00		−0.06		0.00		+0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.1		+0.4		−0.1		+0.4		−0.1		+0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι^1 **Aquarii.** Mag. 5.3				ψ **Andromedæ.** Mag. 5.1				**41 H. Cephei.** Mag. 5.0				δ **Sculptoris.** Mag. 4.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 39		−18 44		23 41		+45 56		23 43		+67 19		23 44		−28 35	
	s		″		s		″		s		″		s		″	
Jan. 1.2	44.62		82.8		45.25		47.7		45.46		62.6		27.04		92.3	
11.2	44.52	10	82.9	1	45.06	19	46.7	10	45.01	45	61.7	9	26.93	11	92.2	1
21.2	44.44	8	82.8	1	44.88	18	45.2	15	44.60	41	60.3	14	26.83	10	91.8	4
31.1	44.37	7	82.5	3	44.73	15	43.3	19	44.23	37	58.4	19	26.75	8	91.0	8
Feb. 10.1	44.32	5	82.0	5	44.61	12	41.2	21	43.93	30	56.0	24	26.69	6	90.0	10
20.1	44.30	2	81.2	8	44.52	9	39.0	22	43.70	23	53.4	26	26.66	3	88.7	13
Mar. 2.0	44.31	1	80.2	10	44.49	3	36.6	24	43.56	14	50.5	29	26.65	1	87.1	16
12.0	44.35	4	78.9	13	44.50	1	34.3	23	43.53	3	47.6	29	26.69	4	85.2	19
22.0	44.43	8	77.4	15	44.57	7	32.1	22	43.60	7	44.8	28	26.76	7	83.2	20
Apr. 1.0	44.54	11	75.7	17	44.70	13	30.2	19	43.77	17	42.1	27	26.87	11	81.0	22
10.9	44.69	15	73.8	19	44.89	19	28.6	16	44.05	28	39.6	25	27.02	15	78.6	24
20.9	44.88	19	71.8	20	45.13	24	27.4	12	44.42	37	37.6	20	27.21	19	76.1	25
30.9	45.11	23	69.6	22	45.42	29	26.6	8	44.89	47	36.0	16	27.44	23	73.6	25
May 10.9	45.37	26	67.4	22	45.76	34	26.2	4	45.43	54	34.9	11	27.71	27	71.0	26
20.8	45.66	29	65.1	23	46.13	37	26.4	2	46.02	59	34.3	6	28.01	30	68.5	25
30.8	45.97	31	62.8	23	46.53	40	27.1	7	46.65	63	34.3	0	28.34	33	66.1	24
June 9.8	46.30	33	60.6	22	46.94	41	28.2	11	47.30	65	34.9	6	28.68	34	63.9	22
19.7	46.63	33	58.6	20	47.36	42	29.8	16	47.96	66	36.0	11	29.03	35	61.9	20
29.7	46.97	34	56.7	19	47.77	41	31.8	20	48.60	64	37.7	17	29.39	36	60.1	18
July 9.7	47.29	32	55.0	17	48.16	39	34.2	24	49.22	62	39.8	21	29.73	34	58.7	14
19.7	47.60	31	53.6	14	48.52	36	36.8	26	49.79	57	42.4	26	30.06	33	57.6	11
29.6	47.88	28	52.5	11	48.85	33	39.7	29	50.30	51	45.3	29	30.36	30	56.8	8
Aug. 8.6	48.13	25	51.7	8	49.14	29	42.8	31	50.74	44	48.5	32	30.63	27	56.5	3
18.6	48.35	22	51.2	5	49.39	25	45.9	31	51.11	37	52.0	35	30.86	23	56.5	0
28.6	48.52	17	51.1	1	49.58	19	49.1	32	51.40	29	55.6	36	31.04	18	56.9	4
Sept. 7.5	48.66	14	51.3	2	49.72	14	52.3	32	51.60	20	59.3	37	31.19	15	57.6	7
17.5	48.75	9	51.7	4	49.81	9	55.4	31	51.71	11	63.0	37	31.28	9	58.6	10
27.5	48.79	4	52.4	7	49.86	5	58.3	29	51.74	3	66.6	36	31.34	6	59.8	12
Oct. 7.4	48.80	1	53.2	8	49.85	1	61.1	28	51.69	5	70.1	35	31.34	0	61.2	14
17.4	48.78	2	54.2	10	49.81	4	63.6	25	51.56	13	73.4	33	31.31	3	62.7	15
27.4	48.72	6	55.3	11	49.72	9	65.8	22	51.35	21	76.4	30	31.25	6	64.2	15
Nov. 6.4	48.64	8	56.3	10	49.60	12	67.6	18	51.08	27	79.1	27	31.16	9	65.6	14
16.3	48.55	9	57.4	11	49.46	14	69.1	15	50.76	32	81.3	22	31.05	11	67.0	14
26.3	48.44	11	58.4	10	49.29	17	70.1	10	50.38	38	83.1	18	30.93	12	68.1	11
Dec. 6.3	48.33	11	59.2	8	49.11	18	70.6	5	49.96	42	84.3	12	30.80	13	69.1	10
16.3	48.21	12	59.9	7	48.92	19	70.7	1	49.52	44	85.0	7	30.67	13	69.8	7
26.2	48.10	11	60.4	5	48.72	20	70.4	3	49.06	46	85.0	0	30.54	13	70.2	4
36.2	48.00	10	60.7	3	48.52	20	69.6	8	48.61	45	84.5	5	30.41	13	70.3	1
Sec δ, Tan δ	1.056		−0.339		1.438		+1.034		2.595		+2.394		1.139		−0.545	
Mean Place	44^s.553		75″.81		46^s.076		33″.67		47^s.422		43″.93		26^s.857		82″.48	
$D'_\psi a$, $D_\omega a$	0.00		+0.02		0.00		−0.07		0.00		−0.16		0.00		+0.04	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.1		+0.4		−0.1		+0.4		−0.1		+0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ^1 Octantis. Mag. 5.1				ϕ Pegasi. Mag. 5.2				ρ Cassiopeiæ. Mag. 4.8				Groombridge 4163. Mag. 6.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 47		−82 29		23 48		+18 38		23 50		+57 1		23 50		+73 55	
	s		″		s		″		s		″		s		″	
Jan. 1.2	7.76	142	67.2	17	6.37	11	39.5	9	3.60	28	32.5	9	35.07	67	74.1	6
11.2	6.34	128	65.5	23	6.26	9	38.6	10	3.32	26	31.6	14	34.40	63	73.5	13
21.2	5.06	110	63.2	27	6.17	8	37.6	12	3.06	23	30.2	19	33.77	57	72.2	18
31.1	3.96	89	60.5	32	6.09	7	36.4	12	2.83	20	28.3	22	33.20	48	70.4	23
Feb. 10.1	3.07	67	57.3	35	6.02	4	35.2	12	2.63	14	26.1	25	32.72	37	68.1	26
20.1	2.40	43	53.8	37	5.98	0	34.0	12	2.49	8	23.6	26	32.35	24	65.5	29
Mar. 2.0	1.97	17	50.1	39	5.98	2	32.8	9	2.41	2	21.0	26	32.11	10	62.6	30
12.0	1.80	7	46.2	39	6.00	7	31.9	8	2.39	6	18.4	26	32.01	4	59.6	30
22.0	1.87	33	42.3	39	6.07	10	31.1	6	2.45	13	15.8	24	32.05	20	56 6	28
Apr. 1.0	2.20	58	38.4	38	6.17	15	30.5	2	2.58	21	13.4	21	32.25	34	53.8	26
10.9	2.78	80	34.6	37	6.32	19	30.3	1	2.79	28	11.3	18	32.59	48	51.2	23
20.9	3.58	101	30.9	33	6.51	23	30.4	4	3.07	34	9.5	13	33.07	59	48.9	19
30.9	4.59	122	27.6	30	6.74	26	30.8	8	3.41	40	8.2	8	33.66	70	47.0	14
May 10.9	5.81	139	24.6	26	7.00	29	31.6	12	3.81	44	7.4	3	34.36	78	45.6	8
20.8	7.20	152	22.0	22	7.29	31	32.8	14	4.25	48	7.1	3	35.14	83	44.8	2
30.8	8.72	163	19.8	17	7.60	33	34.2	17	4.73	49	7.4	7	35.97	87	44.6	3
June 9.8	10.35	169	18.1	11	7.93	34	35.9	20	5.22	50	8.1	13	36.84	87	44.9	8
19.7	12.04	171	17.0	6	8.27	33	37.9	22	5.72	49	9.4	18	37.71	86	45.7	15
29.7	13.75	168	16.4	0	8.60	33	40.1	22	6.21	48	11.2	22	38.57	82	47.2	19
July 9.7	15.43	161	16.4	5	8.93	30	42.3	24	6.69	44	13.4	25	39.39	76	49.1	24
19.7	17.04	149	16.9	11	9.23	28	44.7	24	7.13	40	15.9	29	40.15	69	51.5	28
29.6	18.53	132	18.0	16	9.51	25	47.1	23	7.53	36	18.8	32	40.84	60	54.3	31
Aug. 8.6	19.85	111	19.6	21	9.76	21	49.4	22	7.89	30	22.0	33	41.44	50	57.4	34
18.6	20.96	87	21.7	24	9.97	18	51.6	22	8.19	24	25.3	34	41.94	39	60.8	37
28.6	21.83	59	24.1	28	10.15	13	53.8	19	8.43	17	28.7	35	42.33	28	64.5	37
Sept. 7.5	22.42	29	26.9	29	10.28	9	55.7	18	8.60	12	32.2	34	42.61	16	68.2	38
17.5	22.71	2	29.8	30	10.37	6	57.5	16	8.72	5	35.6	34	42.77	5	72.0	38
27.5	22.69	33	32.8	30	10.43	2	59.1	13	8.77	1	39.0	32	42.82	7	75.8	37
Oct. 7.4	22.36	62	35.8	28	10.45	1	60.4	11	8.76	6	42.2	30	42.75	18	79.5	35
17.4	21.74	89	38.6	26	10.44	4	61.5	8	8.70	11	45.2	27	42.57	29	83.0	33
27.4	20.85	114	41.2	21	10.40	6	62.3	6	8.59	15	47.9	23	42.28	39	86.3	29
Nov. 6.4	19.71	133	43.3	17	10.34	8	62.9	3	8.44	20	50.2	19	41.89	48	89.2	25
16.3	18.38	147	45.0	12	10.26	10	63.2	1	8.24	23	52.1	15	41.41	55	91.7	20
26.3	16.91	157	46.2	5	10.16	11	63.3	1	8.01	26	53.6	10	40.86	61	93.7	15
Dec. 6.3	15.34	160	46.7	1	10.05	11	63.2	4	7.75	28	54.6	5	40.25	65	95.2	9
16.3	13.74	158	46.6	7	9.94	11	62.8	6	7.47	28	55.1	1	39.60	68	96.1	3
26.2	12.16	150	45.9	14	9.83	11	62.2	8	7.19	29	55.0	6	38.92	67	96.4	3
36.2	10.66		44.5		9.72		61.4		6.90		54.4		38.25		96.1	
Sec δ, Tan δ	7.656		−7.591		1.056		+0.337		1.837		+1.542		3.614		+3.473	
Mean Place	$5^{s}.581$		48″.43		$6^{s}.636$		33″.46		$4^{s}.766$		15″.40		$37^{s}.823$		54″.15	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.01		+0.51		0.00		−0.02		0.00		−0.10		0.00		−0.23	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.1		+0.4		−0.1		+0.4		0.0		+0.4		0.0	

Mean Solar Date.	ω Piscium. Mag. 4.0				ε Tucanæ. Mag. 4.7				30 Piscium. Mag. 4.7				2 Ceti. Mag. 4.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 54		+ 6 23		23 55		−66 2		23 57		− 6 29		23 59		−17 48	
	s		″		s		″		s		″		s		″	
Jan. 1.2	53.57		16.2		28.20		96.7		33.04		33.5		20.29		59.3	
11.2	53.48	9	15.5	7	27.81	39	95.5	12	32.95	9	34.0	5	20.19	10	59.6	3
21.2	53.39	9	14.7	8	27.46	35	93.8	17	32.86	9	34.4	4	20.09	10	59.6	0
31.1	53.32	7	14.0	7	27.16	30	91.6	22	32.79	7	34.6	2	20.01	8	59.4	2
Feb. 10.1	53.26	6	13.3	7	26.91	25	89.0	26	32.73	6	34.7	1	19.95	6	59.0	4
20.1	53.22	4	12.7	6	26.73	18	86.0	30	32.69	4	34.6	1	19.91	4	58.3	7
Mar. 2.1	53.21	1	12.3	4	26.62	11	82.7	33	32.68	1	34.3	3	19.89	2	57.3	10
12.0	53.24	3	12.0	3	26.58	4	79.2	35	32.70	2	33.8	5	19.91	2	56.1	12
22.0	53.30	6	12.0	0	26.63	5	75.6	36	32.76	6	33.1	7	19.96	5	54.7	14
Apr. 1.0	53.39	9	12.2	2	26.76	13	71.9	37	32.85	9	32.1	10	20.05	9	53.0	17
10.9	53.53	14	12.6	4	26.97	21	68.2	37	32.98	13	30.9	12	20.18	13	51.2	18
20.9	53.70	17	13.4	8	27.26	29	64.7	35	33.15	17	29.4	15	20.35	17	49.2	20
30.9	53.92	22	14.4	10	27.63	37	61.3	34	33.36	21	27.8	16	20.56	21	47.0	22
May 10.9	54.17	25	15.7	13	28.07	44	58.1	32	33.60	24	25.9	19	20.81	25	44.7	23
20.8	54.44	27	17.3	16	28.57	50	55.2	29	33.88	28	24.0	19	21.09	28	42.4	23
30.8	54.74	30	19.1	18	29.12	55	52.7	25	34.18	30	21.9	21	21.39	30	40.1	23
June 9.8	55.06	32	21.0	19	29.71	59	50.6	21	34.49	31	19.7	22	21.71	32	37.8	23
19.8	55.39	33	23.0	20	30.33	62	49.0	16	34.81	32	17.6	21	22.04	33	35.6	22
29.7	55.71	32	25.2	22	30.96	63	47.9	11	35.14	33	15.5	21	22.38	34	33.7	19
July 9.7	56.03	32	27.3	21	31.58	62	47.4	5	35.46	32	13.5	20	22.71	33	31.9	18
19.7	56.33	30	29.4	21	32.18	60	47.4	0	35.76	30	11.7	18	23.02	31	30.4	15
29.6	56.61	28	31.4	20	32.73	55	47.9	5	36.04	28	10.1	16	23.31	29	29.1	13
Aug. 8.6	56.85	24	33.3	19	33.23	50	49.0	11	36.29	25	8.7	14	23.57	26	28.2	9
18.6	57.07	22	35.0	17	33.66	43	50.5	15	36.51	22	7.6	11	23.80	23	27.7	5
28.6	57.25	18	36.5	15	34.00	34	52.5	20	36.70	19	6.8	8	23.99	19	27.4	3
Sept. 7.5	57.39	14	37.8	13	34.26	26	54.8	23	36.84	14	6.2	6	24.14	15	27.5	1
17.5	57.49	10	38.9	11	34.41	15	57.4	26	36.94	10	5.9	3	24.25	11	27.9	4
27.5	57.55	6	39.7	8	34.47	6	60.1	27	37.01	7	5.8	1	24.32	7	28.5	6
Oct. 7.5	57.58	3	40.3	6	34.43	4	62.9	28	37.04	3	6.0	2	24.35	3	29.3	8
17.4	57.58	0	40.7	4	34.30	13	65.6	27	37.04	0	6.4	4	24.34	1	30.3	10
27.4	57.55	3	40.9	2	34.08	22	68.2	26	37.01	3	6.9	5	24.30	4	31.4	11
Nov. 6.4	57.50	5	40.9	0	33.79	29	70.5	23	36.95	6	7.5	6	24.24	6	32.5	11
16.3	57.43	7	40.7	2	33.44	35	72.4	19	36.88	7	8.2	7	24.16	8	33.6	11
26.3	57.34	9	40.4	3	33.05	39	73.8	14	36.79	9	9.0	8	24.06	10	34.6	10
Dec. 6.3	57.25	9	40.0	4	32.63	42	74.8	10	36.70	9	9.7	7	23.96	10	35.6	10
16.3	57.15	10	39.4	6	32.19	44	75.1	3	36.60	10	10.4	7	23.84	12	36.3	7
26.2	57.05	10	38.7	7	31.76	43	74.9	2	36.50	10	11.0	6	23.73	11	36.9	6
36.2	56.95	10	38.0	7	31.35	41	74.1	8	36.40	10	11.6	6	23.62	11	37.3	4
Sec δ, Tan δ	1.006		+0.112		2.464		−2.252		1.006		−0.114		1.050		−0.321	
Mean Place	$53^{s}.659$		$14''.12$		$27^{s}.325$		$79''.13$		$32^{s}.982$		$31''.23$		$20^{s}.113$		$53''.32$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.01		0.00		+0.15		0.00		+0.01		+0.00		+0.02	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		0.0		+0.4		0.0		+0.4		0.0		+0.4		0.0	

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	1 42	−85 12	Jan.	5 46	−84 49	Jan.	7 17	−86 53	Jan.	9 9	−85 18	Jan.	10 59	−84 7
	s	″		s	″		s	″		s	″		s	″
0.3	24.07	30.34	0.5	63.99	46.63	0.5	40.65	35.95	0.6	29.72	56.41	0.7	56.49	33.50
1.3	23.83	30.38	1.5	63.91	46.93	1.5	40.66	36.28	1.6	29.85	56.70	1.7	56.67	33.71
2.3	23.59	30.42	2.5	63.82	47.24	2.5	40.68	36.61	2.6	29.98	56.99	2.7	56.87	33.92
3.3	23.33	30.46	3.5	63.73	47.56	3.5	40.70	36.96	3.6	30.13	57.29	3.7	57.07	34.13
4.3	23.06	30.50	4.5	63.63	47.91	4.5	40.70	37.32	4.6	30.28	57.62	4.7	57.28	34.35
5.3	22.77	30.54	5.4	63.52	48.27	5.5	40.69	37.70	5.6	30.42	57.98	5.7	57.49	34.59
6.3	22.47	30.56	6.4	63.40	48.62	6.5	40.66	38.10	6.6	30.55	58.36	6.7	57.69	34.86
7.3	22.17	30.56	7.4	63.26	48.97	7.5	40.60	38.50	7.6	30.67	58.75	7.7	57.89	35.15
8.3	21.86	30.54	8.4	63.11	49.31	8.5	40.51	38.90	8.6	30.76	59.15	8.7	58.08	35.46
9.3	21.56	30.49	9.4	62.94	49.63	9.5	40.38	39.29	9.6	30.84	59.54	9.7	58.25	35.78
10.3	21.27	30.42	10.4	62.76	49.93	10.5	40.22	39.65	10.6	30.90	59.93	10.7	58.41	36.11
11.3	21.00	30.33	11.4	62.58	50.20	11.5	40.06	40.00	11.6	30.94	60.30	11.6	58.55	36.43
12.3	20.75	30.24	12.4	62.40	50.44	12.5	39.91	40.33	12.6	30.97	60.65	12.6	58.68	36.73
13.3	20.51	30.15	13.4	62.24	50.68	13.5	39.76	40.65	13.6	31.01	60.99	13.6	58.81	37.02
14.3	20.27	30.08	14.4	62.09	50.93	14.5	39.63	40.95	14.6	31.05	61.32	14.6	58.94	37.29
15.3	20.03	30.02	15.4	61.95	51.19	15.5	39.52	41.26	15.6	31.11	61.64	15.6	59.08	37.55
16.3	19.77	29.98	16.4	61.81	51.46	16.5	39.42	41.58	16.6	31.18	61.97	16.6	59.23	37.82
17.2	19.49	29.94	17.4	61.67	51.75	17.5	39.33	41.93	17.6	31.26	62.33	17.6	59.40	38.10
18.2	19.21	29.90	18.4	61.51	52.07	18.5	39.23	42.31	18.6	31.35	62.72	18.6	59.58	38.40
19.2	18.92	29.85	19.4	61.33	52.40	19.5	39.10	42.71	19.6	31.43	63.13	19.6	59.76	38.73
20.2	18.61	29.77	20.4	61.14	52.72	20.5	38.93	43.11	20.5	31.49	63.55	20.6	59.93	39.09
21.2	18.30	29.66	21.4	60.92	53.02	21.5	38.74	43.51	21.5	31.52	63.98	21.6	60.08	39.46
22.2	18.00	29.53	22.4	60.70	53.30	22.5	38.51	43.89	22.5	31.53	64.41	22.6	60.21	39.84
23.2	17.71	29.37	23.4	60.47	53.55	23.5	38.27	44.24	23.5	31.53	64.82	23.6	60.33	40.22
24.2	17.44	29.21	24.4	60.24	53.77	24.5	38.02	44.57	24.5	31.52	65.20	24.6	60.44	40.58
25.2	17.19	29.04	25.4	60.02	53.98	25.5	37.78	44.88	25.5	31.49	65.57	25.6	60.53	40.93
26.2	16.95	28.88	26.4	59.81	54.19	26.5	37.55	45.18	26.5	31.47	65.92	26.6	60.62	41.26
27.2	16.71	28.74	27.4	59.61	54.39	27.5	37.33	45.47	27.5	31.46	66.27	27.6	60.72	41.58
28.2	16.47	28.61	28.4	59.43	54.60	28.4	37.13	45.76	28.5	31.46	66.61	28.6	60.83	41.89
29.2	16.24	28.48	29.4	59.24	54.82	29.4	36.94	46.06	29.5	31.47	66.96	29.6	60.94	42.20
30.2	16.00	28.36	30.4	59.05	55.05	30.4	36.75	46.37	30.5	31.48	67.32	30.6	61.06	42.52
31.2	15.74	28.24	31.4	58.86	55.29	31.4	36.56	46.70	31.5	31.50	67.69	31.6	61.19	42.85
32.2	15.47	28.11	32.4	58.66	55.54	32.4	36.35	47.04	32.5	31.51	68.08	32.6	61.31	43.19
	11.97	−11.93		11.10	−11.05		18.46	−18.43		12.25	−12.21		9.77	−9.72
	$1^h\ 42^m$	$13^s.66$		$5^h\ 46^m$	$49^s.81$		$7^h\ 17^m$	$21^s.00$		$9^h\ 9^m$	$22^s.33$		$10^h\ 59^m$	$56^s.35$
	−85° 12′	15″.81		−84° 49′	50″.68		−86° 53′	46″.93		−85° 19′	13″.38		−84° 7′	52″.51

[Eph 14]

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	1 42	−85 12	Feb.	5 46	−84 49	Feb.	7 17	−86 53	Feb.	9 9	−85 19	Feb.	11 0	−84 7
	s	″		s	″		s	″		s	″		s	″
1.2	15.47	28.11	1.4	58.66	55.54	1.4	36.35	47.04	1.5	31.51	8.08	1.6	1.31	43.19
2.2	15.19	27.98	2.4	58.43	55.80	2.4	36.13	47.38	2.5	31.51	8.49	2.6	1.44	43.56
3.2	14.90	27.83	3.4	58.20	56.06	3.4	35.89	47.74	3.5	31.50	8.91	3.6	1.56	43.94
4.2	14.60	27.65	4.4	57.96	56.30	4.4	35.61	48.11	4.5	31.48	9.33	4.6	1.67	44.34
5.2	14.32	27.44	5.4	57.70	56.52	5.4	35.31	48.46	5.5	31.43	9.76	5.6	1.76	44.75
6.2	14.05	27.22	6.4	57.43	56.72	6.4	34.98	48.78	6.5	31.36	10.18	6.6	1.84	45.17
7.2	13.80	26.98	7.4	57.15	56.89	7.4	34.63	49.09	7.5	31.28	10.59	7.6	1.90	45.59
8.2	13.56	26.73	8.4	56.88	57.04	8.4	34.28	49.37	8.5	31.19	10.97	8.6	1.95	45.99
9.2	13.34	26.48	9.4	56.63	57.18	9.4	33.94	49.63	9.5	31.09	11.33	9.6	1.98	46.37
10.2	13.13	26.24	10.4	56.39	57.31	10.4	33.62	49.87	10.5	31.00	11.68	10.6	2.02	46.73
11.2	12.93	26.02	11.3	56.16	57.45	11.4	33.32	50.12	11.5	30.92	12.02	11.6	2.08	47.08
12.2	12.72	25.82	12.3	55.93	57.60	12.4	33.03	50.38	12.5	30.86	12.36	12.6	2.14	47.42
13.2	12.49	25.63	13.3	55.70	57.77	13.4	32.76	50.66	13.5	30.81	12.71	13.6	2.21	47.78
14.2	12.25	25.45	14.3	55.47	57.96	14.4	32.49	50.95	14.5	30.76	13.09	14.6	2.29	48.15
15.2	12.00	25.25	15.3	55.22	58.16	15.4	32.19	51.27	15.5	30.72	13.49	15.6	2.38	48.54
16.2	11.73	25.03	16.3	54.95	58.36	16.4	31.86	51.61	16.5	30.66	13.90	16.6	2.46	48.95
17.2	11.45	24.79	17.3	54.67	58.55	17.4	31.51	51.93	17.5	30.57	14.33	17.5	2.53	49.38
18.2	11.18	24.52	18.3	54.38	58.72	18.4	31.13	52.24	18.5	30.46	14.75	18.5	2.59	49.83
19.2	10.93	24.22	19.3	54.08	58.86	19.4	30.73	52.52	19.5	30.33	15.16	19.5	2.62	50.27
20.2	10.71	23.91	20.3	53.78	58.97	20.4	30.31	52.77	20.5	30.19	15.55	20.5	2.64	50.69
21.2	10.50	23.61	21.3	53.49	59.05	21.4	29.90	53.01	21.5	30.04	15.91	21.5	2.64	51.11
22.1	10.30	23.31	22.3	53.21	59.13	22.4	29.50	53.22	22.5	29.89	16.25	22.5	2.64	51.50
23.1	10.12	23.03	23.3	52.94	59.20	23.4	29.13	53.42	23.5	29.76	16.59	23.5	2.65	51.87
24.1	9.95	22.75	24.3	52.69	59.27	24.4	28.77	53.63	24.5	29.63	16.91	24.5	2.65	52.23
25.1	9.77	22.49	25.3	52.44	59.35	25.4	28.42	53.84	25.5	29.51	17.22	25.5	2.67	52.59
26.1	9.58	22.24	26.3	52.19	59.45	26.4	28.09	54.06	26.4	29.40	17.55	26.5	2.69	52.95
27.1	9.38	21.99	27.3	51.94	59.56	27.4	27.75	54.29	27.4	29.29	17.89	27.5	2.72	53.32
28.1	9.18	21.74	28.3	51.69	59.68	28.4	27.41	54.54	28.4	29.19	18.24	28.5	2.75	53.70
29.1	8.96	21.49	29.3	51.43	59.80	29.4	27.05	54.79	29.4	29.07	18.61	29.5	2.78	54.09
30.1	8.73	21.22	30.3	51.15	59.91	30.4	26.68	55.05	30.4	28.95	18.98	30.5	2.81	54.49
	11.97	−11.93		11.10	−11.06		18.48	−18.45		12.26	−12.22		9.78	−9.73
	1h 42m	13s.66		5h 46m	49s.81		7h 17m	21s.00		9h 9m	22s.33		10h 59m	56s.35
	−85° 12′	15″.81		−84° 49′	50″.68		−86° 53′	46″.93		−85° 19′	13″.38		−84° 7′	52″.51

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	1 42	−85 12	Mar.	5 46	−84 49	Mar.	7 17	−86 53	Mar.	9 9	−85 19	Mar.	11 0	−84 7
	s	″		s	″		s	″		s	″		s	″
1.1	8.96	21.49	1.3	51.43	59.80	1.4	27.05	54.79	1.4	29.07	18.61	1.5	2.78	54.09
2.1	8.73	21.22	2.3	51.15	59.91	2.4	26.68	55.05	2.4	28.95	18.98	2.5	2.81	54.49
3.1	8.51	20.92	3.3	50.86	60.02	3.4	26.28	55.31	3.4	28.82	19.36	3.5	2.83	54.91
4.1	8.29	20.61	4.3	50.57	60.12	4.4	25.86	55.56	4.4	28.66	19.75	4.5	2.85	55.35
5.1	8.08	20.27	5.3	50.27	60.20	5.4	25.41	55.80	5.4	28.48	20.14	5.5	2.84	55.79
6.1	7.89	19.91	6.3	49.95	60.25	6.3	24.94	56.01	6.4	28.29	20.50	6.5	2.81	56.23
7.1	7.72	19.54	7.3	49.63	60.27	7.3	24.46	56.19	7.4	28.09	20.84	7.5	2.76	56.66
8.1	7.56	19.18	8.3	49.33	60.26	8.3	24.00	56.34	8.4	27.87	21.15	8.5	2.71	57.06
9.1	7.42	18.83	9.3	49.04	60.25	9.3	23.54	56.48	9.4	27.66	21.45	9.5	2.66	57.45
10.1	7.29	18.49	10.3	48.76	60.25	10.3	23.11	56.61	10.4	27.47	21.75	10.5	2.61	57.81
11.1	7.16	18.17	11.3	48.49	60.25	11.3	22.70	56.75	11.4	27.29	22.03	11.5	2.57	58.16
12.1	7.02	17.87	12.3	48.24	60.27	12.3	22.31	56.91	12.4	27.12	22.32	12.5	2.55	58.52
13.1	6.86	17.57	13.3	47.98	60.31	13.3	21.92	57.09	13.4	26.96	22.63	13.5	2.54	58.89
14.1	6.68	17.28	14.3	47.71	60.37	14.3	21.52	57.29	14.4	26.82	22.96	14.5	2.53	59.27
15.1	6.50	16.97	15.3	47.42	60.44	15.3	21.11	57.50	15.4	26.66	23.30	15.5	2.53	59.67
16.1	6.31	16.63	16.3	47.11	60.49	16.3	20.66	57.71	16.4	26.47	23.66	16.5	2.51	60.10
17.1	6.12	16.27	17.3	46.79	60.52	17.3	20.19	57.91	17.4	26.27	24.02	17.5	2.48	60.54
18.1	5.95	15.89	18.3	46.47	60.53	18.3	19.69	58.09	18.4	26.05	24.37	18.5	2.43	60.97
19.1	5.79	15.50	19.3	46.15	60.51	19.3	19.18	58.24	19.4	25.81	24.69	19.5	2.36	61.39
20.1	5.66	15.10	20.2	45.84	60.46	20.3	18.68	58.36	20.4	25.56	24.99	20.5	2.28	61.79
21.1	5.56	14.70	21.2	45.54	60.40	21.3	18.19	58.46	21.4	25.32	25.26	21.5	2.19	62.17
22.1	5.47	14.32	22.2	45.26	60.32	22.3	17.72	58.54	22.4	25.08	25.52	22.5	2.10	62.53
23.1	5.39	13.96	23.2	44.99	60.25	23.3	17.27	58.61	23.4	24.85	25.76	23.5	2.01	62.88
24.1	5.30	13.62	24.2	44.73	60.18	24.3	16.84	58.69	24.4	24.64	26.00	24.5	1.93	63.22
25.1	5.20	13.28	25.2	44.48	60.13	25.3	16.42	58.79	25.4	24.44	26.23	25.5	1.86	63.55
26.1	5.10	12.95	26.2	44.23	60.10	26.3	16.02	58.89	26.4	24.24	26.48	26.4	1.79	63.88
27.1	4.99	12.63	27.2	43.97	60.08	27.3	15.61	59.01	27.4	24.04	26.74	27.4	1.73	64.22
28.1	4.87	12.30	28.2	43.71	60.06	28.3	15.19	59.13	28.4	23.85	27.01	28.4	1.68	64.57
29.1	4.74	11.96	29.2	43.44	60.04	29.3	14.76	59.25	29.4	23.65	27.29	29.4	1.63	64.94
30.1	4.61	11.61	30.2	43.15	60.02	30.3	14.31	59.38	30.4	23.43	27.58	30.4	1.56	65.32
31.0	4.49	11.24	31.2	42.86	59.98	31.3	13.83	59.50	31.4	23.20	27.87	31.4	1.49	65.71
32.0	4.37	10.85	32.2	42.56	59.92	32.3	13.33	59.61	32.4	22.95	28.15	32.4	1.41	66.11
	11.96	−11.92		11.10	−11.06		18.49	−18.46		12.26	−12.22		9.78	−9.73
	1h 42m	13s.66		5h 46m	49s.81		7h 17m	21s.00		9h 9m	22s.33		10h 59m	56s.35
	−85° 12′	15″.81		−84° 49′	50″.68		−86° 53′	46″.93		−85° 19′	13″.38		−84° 7′	52″.51

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	1 42	−85 11	Apr.	5 46	−84 49	Apr.	7 16	−86 53	Apr.	9 9	−85 19	Apr.	10 59	−84 8
	s	″		s	″		s	″		s	″		s	″
1.0	4.37	70.85	1.2	42.56	59.92	1.3	73.33	59.61	1.4	22.95	28.15	1.4	61.41	6.11
2.0	4.26	70.45	2.2	42.25	59.84	2.3	72.82	59.70	2.4	22.68	28.42	2.4	61.30	6.51
3.0	4.17	70.03	3.2	41.94	59.73	3.3	72.30	59.76	3.3	22.40	28.67	3.4	61.17	6.89
4.0	4.11	69.61	4.2	41.64	59.59	4.3	71.78	59.80	4.3	22.12	28.90	4.4	61.04	7.25
5.0	4.07	69.19	5.2	41.37	59.45	5.3	71.27	59.81	5.3	21.83	29.11	5.4	60.90	7.59
6.0	4.04	68.79	6.2	41.11	59.31	6.3	70.80	59.81	6.3	21.55	29.30	6.4	60.77	7.91
7.0	4.01	68.41	7.2	40.86	59.17	7.3	70.35	59.82	7.3	21.30	29.48	7.4	60.65	8.21
8.0	3.97	68.05	8.2	40.61	59.04	8.3	69.92	59.84	8.3	21.06	29.65	8.4	60.54	8.51
9.0	3.92	67.72	9.2	40.37	58.93	9.3	69.50	59.87	9.3	20.83	29.84	9.4	60.44	8.82
10.0	3.85	67.38	10.2	40.12	58.85	10.3	69.08	59.92	10.3	20.61	30.06	10.4	60.36	9.14
11.0	3.77	67.02	11.2	39.86	58.78	11.2	68.64	59.99	11.3	20.38	30.29	11.4	60.27	9.47
12.0	3.68	66.66	12.2	39.59	58.70	12.2	68.18	60.07	12.3	20.15	30.53	12.4	60.18	9.82
13.0	3.60	66.28	13.2	39.31	58.60	13.2	67.69	60.14	13.3	19.90	30.77	13.4	60.08	10.19
14.0	3.52	65.86	14.2	39.02	58.49	14.2	67.18	60.19	14.3	19.62	31.01	14.4	59.97	10.56
15.0	3.46	65.42	15.2	38.72	58.35	15.2	66.65	60.21	15.3	19.32	31.23	15.4	59.83	10.92
16.0	3.43	64.98	16.2	38.43	58.17	16.2	66.13	60.20	16.3	19.01	31.43	16.4	59.67	11.26
17.0	3.42	64.55	17.2	38.16	57.98	17.2	65.63	60.18	17.3	18.70	31.60	17.4	59.51	11.58
17.9	3.42	64.14	18.2	37.91	57.77	18.2	65.15	60.13	18.3	18.40	31.75	18.4	59.34	11.87
18.9	3.44	63.76	19.2	37.67	57.57	19.2	64.69	60.08	19.3	18.12	31.87	19.4	59.18	12.14
19.9	3.47	63.39	20.2	37.44	57.38	20.2	64.24	60.02	20.3	17.85	31.98	20.4	59.03	12.40
20.9	3.49	63.03	21.2	37.22	57.20	21.2	63.82	59.96	21.3	17.59	32.08	21.4	58.88	12.65
21.9	3.50	62.68	22.2	37.01	57.03	22.2	63.42	59.91	22.3	17.35	32.20	22.4	58.75	12.89
22.9	3.50	62.34	23.2	36.80	56.86	23.2	63.01	59.88	23.3	17.10	32.32	23.4	58.62	13.14
23.9	3.50	62.00	24.2	36.58	56.71	24.2	62.61	59.86	24.3	16.86	32.46	24.4	58.50	13.41
24.9	3.48	61.66	25.1	36.36	56.57	25.2	62.20	59.85	25.3	16.61	32.62	25.4	58.37	13.69
25.9	3.46	61.30	26.1	36.13	56.42	26.2	61.77	59.84	26.3	16.36	32.78	26.4	58.25	13.97
26.9	3.44	60.93	27.1	35.89	56.27	27.2	61.31	59.83	27.3	16.10	32.94	27.4	58.12	14.26
27.9	3.44	60.54	28.1	35.64	56.10	28.2	60.84	59.81	28.3	15.82	33.10	28.4	57.97	14.57
28.9	3.44	60.14	29.1	35.38	55.90	29.2	60.35	59.76	29.3	15.52	33.24	29.4	57.81	14.87
29.9	3.46	59.72	30.1	35.13	55.68	30.2	59.86	59.69	30.3	15.21	33.37	30.4	57.63	15.16
30.9	3.50	59.30	31.1	34.89	55.44	31.2	59.37	59.60	31.3	14.89	33.48	31.3	57.44	15.43
31.9	3.55	58.88	32.1	34.66	55.18	32.2	58.89	59.48	32.3	14.57	33.55	32.3	57.25	15.68
	11.95	−11.91		11.10	−11.06		18.49	−18.47		12.27	−12.23		9.79	−9.74
	$1^h\,42^m$	$13^s.66$		$5^h\,46^m$	$49^s.81$		$7^h\,17^m$	$21^s.00$		$9^h\,9^m$	$22^s.33$		$10^h\,59^m$	$56^s.35$
	−85° 12′	15″.81		−84° 49′	50″.68		−86° 53′	46″.93		−85° 19′	13″.38		−84° 7′	52″.51

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	1 42	−85 11	May	5 46	−84 49	May	7 16	−86 53	May	9 9	−85 19	May	10 59	−84 8
	s	″		s	″		s	″		s	″		s	″
1.9	3.55	58.88	1.1	34.89	55.44	1.2	59.37	59.60	1.3	14.89	33.48	1.3	57.44	15.43
2.9	3.62	58.48	2.1	34.66	55.18	2.2	58.89	59.48	2.3	14.57	33.55	2.3	57.25	15.68
3.9	3.70	58.11	3.1	34.44	54.91	3.2	58.43	59.35	3.3	14.26	33.61	3.3	57.05	15.90
4.9	3.79	57.76	4.1	34.24	54.65	4.2	58.01	59.22	4.3	13.97	33.65	4.3	56.86	16.10
5.9	3.86	57.42	5.1	34.06	54.40	5.2	57.61	59.09	5.3	13.70	33.68	5.3	56.68	16.29
6.9	3.91	57.09	6.1	33.88	54.17	6.2	57.23	58.98	6.3	13.45	33.73	6.3	56.52	16.48
7.9	3.95	56.77	7.1	33.71	53.97	7.2	56.86	58.89	7.3	13.20	33.80	7.3	56.37	16.68
8.9	3.97	56.43	8.1	33.53	53.78	8.2	56.48	58.82	8.3	12.96	33.89	8.3	56.24	16.90
9.9	4.00	56.08	9.1	33.33	53.59	9.2	56.08	58.76	9.3	12.71	33.99	9.3	56.09	17.14
10.9	4.03	55.70	10.1	33.11	53.39	10.2	55.66	58.70	10.2	12.43	34.09	10.3	55.93	17.39
11.9	4.08	55.30	11.1	32.89	53.17	11.2	55.22	58.62	11.2	12.14	34.19	11.3	55.76	17.64
12.9	4.14	54.89	12.1	32.66	52.93	12.2	54.75	58.52	12.2	11.84	34.28	12.3	55.58	17.89
13.9	4.22	54.49	13.1	32.44	52.67	13.2	54.29	58.40	13.2	11.53	34.34	13.3	55.38	18.13
14.9	4.33	54.10	14.1	32.23	52.38	14.2	53.84	58.25	14.2	11.20	34.38	14.3	55.17	18.34
15.9	4.46	53.73	15.1	32.05	52.08	15.2	53.41	58.08	15.2	10.89	34.39	15.3	54.95	18.52
16.9	4.59	53.39	16.1	31.89	51.77	16.2	53.01	57.89	16.2	10.59	34.38	16.3	54.74	18.68
17.9	4.72	53.07	17.1	31.74	51.47	17.2	52.63	57.69	17.2	10.30	34.35	17.3	54.54	18.82
18.9	4.84	52.76	18.1	31.59	51.18	18.1	52.27	57.50	18.2	10.03	34.31	18.3	54.35	18.95
19.9	4.96	52.46	19.1	31.45	50.91	19.1	51.93	57.32	19.2	9.78	34.29	19.3	54.16	19.08
20.9	5.07	52.17	20.1	31.32	50.64	20.1	51.61	57.16	20.2	9.54	34.28	20.3	53.99	19.20
21.9	5.16	51.88	21.1	31.18	50.39	21.1	51.30	57.02	21.2	9.29	34.27	21.3	53.82	19.33
22.9	5.25	51.58	22.1	31.05	50.15	22.1	50.98	56.88	22.2	9.04	34.26	22.3	53.66	19.47
23.9	5.34	51.26	23.1	30.91	49.91	23.1	50.64	56.74	23.2	8.80	34.27	23.3	53.50	19.61
24.9	5.43	50.93	24.1	30.76	49.67	24.1	50.28	56.60	24.2	8.55	34.28	24.3	53.33	19.77
25.9	5.53	50.59	25.1	30.60	49.42	25.1	49.91	56.46	25.2	8.28	34.30	25.3	53.15	19.94
26.9	5.64	50.23	26.1	30.43	49.15	26.1	49.52	56.30	26.2	8.00	34.31	26.3	52.96	20.11
27.9	5.77	49.87	27.1	30.26	48.86	27.1	49.12	56.12	27.2	7.70	34.30	27.3	52.76	20.27
28.9	5.93	49.52	28.1	30.10	48.54	28.1	48.73	55.91	28.2	7.40	34.27	28.3	52.54	20.41
29.9	6.10	49.18	29.1	29.96	48.19	29.1	48.35	55.69	29.2	7.09	34.21	29.3	52.31	20.53
30.9	6.28	48.87	30.1	29.84	47.84	30.1	47.99	55.44	30.2	6.80	34.13	30.3	52.08	20.63
31.9	6.47	48.58	31.1	29.73	47.50	31.1	47.66	55.19	31.2	6.52	34.03	31.3	51.86	20.70
32.9	6.65	48.31	32.0	29.64	47.17	32.1	47.37	54.94	32.2	6.27	33.92	32.3	51.65	20.76
11.95		−11.90	11.10		−11.05	18.49		−18.46	12.27		−12.23	9.79		−9.74
1h 42m		13s.66	5h 46m		49s.81	7h 17m		21s.00	9h 9m		22s.33	10h 59m		56s.35
−85° 12′		15″.81	−84° 49′		50″.68	−86° 53′		46″.93	−85° 19′		13″.38	−84° 7′		52″.51

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	1 42	−85 11	June	5 46	−84 49	June	7 16	−86 53	June	9 8	−85 19	June	10 59	−84 8
	s	″		s	″		s	″		s	″		s	″
1.9	6.65	48.31	1.0	29.64	47.17	1.1	47.37	54.94	1.2	66.27	33.92	1.3	51.65	20.76
2.9	6.81	48.05	2.0	29.56	46.86	2.1	47.10	54.70	2.2	66.03	33.81	2.3	51.45	20.89
3.9	6.95	47.81	3.0	29.48	46.57	3.1	46.84	54.49	3.2	65.80	33.72	3.3	51.27	20.85
4.9	7.08	47.55	4.0	29.40	46.30	4.1	46.58	54.29	4.2	65.58	33.65	4.3	51.10	20.92
5.9	7.20	47.28	5.0	29.30	46.04	5.1	46.31	54.11	5.2	65.35	33.59	5.3	50.93	21.00
6.9	7.32	46.99	6.0	29.19	45.78	6.1	46.01	53.94	6.2	65.12	33.55	6.3	50.76	21.10
7.9	7.45	46.68	7.0	29.07	45.51	7.1	45.70	53.76	7.2	64.87	33.51	7.2	50.58	21.22
8.9	7.60	46.36	8.0	28.95	45.21	8.1	45.36	53.56	8.2	64.61	33.46	8.2	50.38	21.33
9.9	7.77	46.05	9.0	28.83	44.89	9.1	45.02	53.33	9.2	64.33	33.39	9.2	50.17	21.42
10.9	7.97	45.74	10.0	28.71	44.55	10.1	44.69	53.08	10.2	64.04	33.29	10.2	49.94	21.50
11.8	8.18	45.45	11.0	28.61	44.19	11.1	44.38	52.80	11.2	63.76	33.17	11.2	49.71	21.55
12.8	8.41	45.19	12.0	28.53	43.82	12.1	44.09	52.51	12.2	63.49	33.03	12.2	49.48	21.58
13.8	8.64	44.95	13.0	28.48	43.46	13.1	43.83	52.22	13.2	63.24	32.87	13.2	49.26	21.58
14.8	8.85	44.73	14.0	28.45	43.11	14.1	43.60	51.93	14.2	63.00	32.69	14.2	49.05	21.56
15.8	9.05	44.53	15.0	28.42	42.78	15.1	43.40	51.65	15.1	62.78	32.51	15.2	48.85	21.53
16.8	9.25	44.33	16.0	28.39	42.46	16.1	43.21	51.38	16.1	62.58	32.35	16.2	48.66	21.50
17.8	9.44	44.14	17.0	28.37	42.17	17.1	43.03	51.12	17.1	62.39	32.20	17.2	48.48	21.48
18.8	9.61	43.95	18.0	28.34	41.89	18.1	42.85	50.88	18.1	62.19	32.06	18.2	48.31	21.47
19.8	9.78	43.75	18.9	28.31	41.60	19.1	42.67	50.65	19.1	61.99	31.93	19.2	48.14	21.47
20.8	9.96	43.53	19.9	28.27	41.32	20.1	42.47	50.42	20.1	61.79	31.80	20.2	47.97	21.47
21.8	10.14	43.30	20.9	28.22	41.03	21.1	42.25	50.19	21.1	61.58	31.68	21.2	47.79	21.48
22.8	10.33	43.07	21.9	28.16	40.72	22.1	42.03	49.95	22.1	61.36	31.55	22.2	47.60	21.50
23.8	10.53	42.82	22.9	28.11	40.40	23.0	41.79	49.69	23.1	61.13	31.41	23.2	47.40	21.50
24.8	10.75	42.58	23.9	28.06	40.06	24.0	41.55	49.40	24.1	60.89	31.25	24.2	47.19	21.50
25.8	11.00	42.35	24.9	28.01	39.69	25.0	41.32	49.10	25.1	60.64	31.07	25.2	46.96	21.48
26.8	11.25	42.14	25.9	27.99	39.32	26.0	41.10	48.78	26.1	60.40	30.86	26.2	46.74	21.44
27.8	11.51	41.96	26.9	27.99	38.95	27.0	40.92	48.45	27.1	60.18	30.64	27.2	46.52	21.37
28.8	11.76	41.80	27.9	28.00	38.60	28.0	40.78	48.12	28.1	59.98	30.41	28.2	46.32	21.28
29.8	12.00	41.66	28.9	28.03	38.26	29.0	40.67	47.80	29.1	59.80	30.17	29.2	46.12	21.17
30.8	12.22	41.54	29.9	28.06	37.94	30.0	40.57	47.50	30.1	59.64	29.94	30.2	45.94	21.07
31.8	12.43	41.42	30.9	28.10	37.65	31.0	40.48	47.22	31.1	59.48	29.74	31.2	45.78	20.98
32.8	12.62	41.28	31.9	28.13	37.38	32.0	40.38	46.97	32.1	59.33	29.55	32.2	45.62	20.90
	11.94	−11.90		11.09	−11.05		18.48	−18.45		12.27	−12.23		9.79	−9.74
	$1^h\ 42^m$	$13^s.66$		$5^h\ 46^m$	$49^s.81$		$7^h\ 17^m$	$21^s.00$		$9^h\ 9^m$	$22^s.33$		$10^h\ 59^m$	$56^s.35$
	−85° 12′	15″.81		−84° 49′	50″.68		−86° 53′	46″.93		−85° 19′	13″.38		−84° 7′	52″.51

[Eph 14]

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	1 42	−85 11	July	5 46	−84 49	July	7 16	−86 53	July	9 8	−85 19	July	10 59	−84 8
	s	″		s	″		s	″		s	″		s	″
1.8	12.43	41.42	1.9	28.13	37.38	1.0	40.48	47.22	1.1	59.48	29.74	1.2	45.78	20.98
2.8	12.62	41.28	2.9	28.15	37.11	2.0	40.38	46.97	2.1	59.33	29.55	2.2	45.62	20.90
3.8	12.81	41.14	3.9	28.14	36.83	3.0	40.27	46.72	3.1	59.18	29.38	3.2	45.47	20.84
4.8	13.00	40.97	4.9	28.13	36.54	4.0	40.14	46.47	4.1	59.01	29.21	4.2	45.31	20.79
5.8	13.21	40.78	5.9	28.12	36.22	5.0	39.98	46.21	5.1	58.82	29.04	5.2	45.14	20.75
6.8	13.44	40.59	6.9	28.12	35.88	6.0	39.81	45.93	6.1	58.62	28.86	6.2	44.95	20.70
7.8	13.69	40.41	7.9	28.13	35.52	7.0	39.65	45.63	7.1	58.42	28.65	7.2	44.75	20.63
8.8	13.96	40.26	8.9	28.17	35.16	8.0	39.51	45.31	8.1	58.21	28.41	8.2	44.54	20.54
9.8	14.23	40.13	9.9	28.22	34.81	9.0	39.39	44.97	9.1	58.02	28.16	9.2	44.33	20.42
10.8	14.51	40.02	10.9	28.28	34.47	10.0	39.30	44.62	10.1	57.84	27.89	10.2	44.13	20.28
11.8	14.78	39.93	11.9	28.36	34.14	11.0	39.24	44.27	11.1	57.69	27.60	11.2	43.94	20.12
12.8	15.04	39.86	12.9	28.45	33.83	11.9	39.21	43.93	12.1	57.55	27.31	12.2	43.76	19.95
13.8	15.28	39.81	13.9	28.54	33.53	12.9	39.20	43.61	13.1	57.43	27.04	13.2	43.60	19.78
14.8	15.52	39.76	14.9	28.63	33.26	13.9	39.20	43.31	14.1	57.32	26.78	14.1	43.45	19.61
15.8	15.74	39.71	15.9	28.71	33.00	14.9	39.20	43.02	15.1	57.22	26.53	15.1	43.30	19.44
16.8	15.96	39.66	16.9	28.78	32.74	15.9	39.20	42.74	16.1	57.12	26.29	16.1	43.16	19.28
17.8	16.18	39.59	17.9	28.85	32.47	16.9	39.19	42.47	17.1	57.01	26.05	17.1	43.03	19.14
18.7	16.40	39.52	18.9	28.92	32.20	17.9	39.17	42.20	18.1	56.90	25.82	18.1	42.89	19.01
19.7	16.62	39.44	19.9	28.98	31.92	18.9	39.13	41.94	19.1	56.78	25.60	19.1	42.74	18.88
20.7	16.86	39.35	20.9	29.03	31.62	19.9	39.08	41.66	20.1	56.64	25.36	20.1	42.57	18.75
21.7	17.11	39.25	21.9	29.09	31.30	20.9	39.03	41.35	21.1	56.50	25.11	21.1	42.40	18.61
22.7	17.38	39.16	22.9	29.18	30.97	21.9	38.98	41.02	22.0	56.36	24.85	22.1	42.23	18.45
23.7	17.66	39.09	23.9	29.28	30.63	22.9	38.95	40.68	23.0	56.22	24.56	23.1	42.04	18.28
24.7	17.95	39.06	24.9	29.40	30.31	23.9	38.95	40.34	24.0	56.09	24.25	24.1	41.86	18.09
25.7	18.24	39.05	25.9	29.53	30.00	24.9	38.97	39.98	25.0	55.98	23.93	25.1	41.69	17.87
26.7	18.52	39.06	26.9	29.67	29.72	25.9	39.02	39.63	26.0	55.89	23.60	26.1	41.54	17.63
27.7	18.77	39.09	27.9	29.81	29.47	26.9	39.11	39.31	27.0	55.82	23.29	27.1	41.41	17.39
28.7	18.99	39.13	28.9	29.95	29.24	27.9	39.22	39.02	28.0	55.77	22.99	28.1	41.29	17.16
29.7	19.21	39.15	29.9	30.07	29.02	28.9	39.32	38.75	29.0	55.74	22.71	29.1	41.18	16.94
30.7	19.42	39.16	30.9	30.19	28.81	29.9	39.41	38.50	30.0	55.70	22.45	30.1	41.08	16.75
31.7	19.62	39.16	31.9	30.29	28.58	30.9	39.48	38.25	31.0	55.65	22.20	31.1	40.97	16.56
32.7	19.84	39.14	32.9	30.39	28.34	31.9	39.53	37.99	32.0	55.58	21.96	32.1	40.86	16.38
	11.94	−11.89		11.09	−11.04		18.46	−18.43		12.27	−12.23		9.79	−9.74
	$1^h\ 42^m$	$13^s.66$		$5^h\ 46^m$	$49^s.81$		$7^h\ 17^m$	$21^s.00$		$9^h\ 9^m$	$22^s.33$		$10^h\ 59^m$	$56^s.35$
	−85° 12′	15″.81		−84° 49′	50″.68		−86° 53′	46″.93		−85° 19′	13″.38		−84° 7′	52″.51

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Aug.	1 42	−85 11	Aug.	5 46	−84 49	Aug.	7 16	−86 53	Aug.	9 8	−85 19	Aug.	10 59	−84 8
	s	″		s	″		s	″		s	″		s	″
1.7	19.84	39.14	1.9	30.39	28.34	1.9	39.56	37.72	1.0	55.58	21.96	1.1	40.86	16.38
2.7	20.07	39.11	2.9	30.49	28.08	2.9	39.59	37.43	2.0	55.50	21.72	2.1	40.73	16.21
3.7	20.32	39.10	3.9	30.60	27.80	3.9	39.63	37.12	3.0	55.41	21.45	3.1	40.59	16.02
4.7	20.59	39.09	4.9	30.73	27.50	4.9	39.69	36.79	4.0	55.31	21.15	4.1	40.44	15.81
5.7	20.87	39.11	5.9	30.89	27.21	5.9	39.78	36.46	5.0	55.23	20.83	5.1	40.29	15.58
6.7	21.15	39.15	6.9	31.05	26.93	6.9	39.91	36.12	6.0	55.16	20.50	6.1	40.15	15.33
7.7	21.42	39.21	7.9	31.22	26.67	7.9	40.06	35.79	7.0	55.11	20.16	7.1	40.02	15.06
8.7	21.68	39.30	8.9	31.41	26.43	8.9	40.24	35.48	8.0	55.09	19.81	8.1	39.90	14.77
9.7	21.93	39.40	9.9	31.60	26.21	9.9	40.43	35.20	8.9	55.08	19.47	9.1	39.80	14.48
10.7	22.17	39.51	10.9	31.79	26.02	10.9	40.62	34.93	9.9	55.09	19.15	10.1	39.71	14.19
11.7	22.40	39.63	11.9	31.97	25.84	11.9	40.82	34.67	10.9	55.11	18.85	11.1	39.63	13.91
12.7	22.60	39.74	12.8	32.14	25.67	12.9	41.01	34.43	11.9	55.13	18.56	12.1	39.56	13.64
13.7	22.80	39.83	13.8	32.31	25.50	13.9	41.17	34.20	12.9	55.15	18.27	13.1	39.50	13.39
14.7	23.00	39.92	14.8	32.47	25.33	14.9	41.33	33.96	13.9	55.17	18.00	14.1	39.43	13.15
15.7	23.21	40.00	15.8	32.62	25.15	15.9	41.48	33.72	14.9	55.17	17.74	15.1	39.36	12.91
16.7	23.42	40.07	16.8	32.78	24.95	16.9	41.62	33.46	15.9	55.16	17.46	16.1	39.28	12.67
17.7	23.65	40.14	17.8	32.93	24.73	17.9	41.76	33.18	16.9	55.15	17.18	17.1	39.19	12.44
18.7	23.89	40.21	18.8	33.09	24.50	18.9	41.91	32.90	17.9	55.12	16.89	18.1	39.09	12.19
19.7	24.14	40.29	19.8	33.27	24.27	19.9	42.08	32.60	18.9	55.10	16.57	19.0	38.99	11.92
20.7	24.40	40.39	20.8	33.47	24.05	20.9	42.28	32.30	19.9	55.09	16.24	20.0	38.89	11.63
21.7	24.66	40.53	21.8	33.67	23.85	21.9	42.50	32.01	20.9	55.10	15.91	21.0	38.79	11.33
22.7	24.90	40.69	22.8	33.89	23.67	22.9	42.76	31.73	21.9	55.14	15.57	22.0	38.71	11.01
23.6	25.12	40.87	23.8	34.12	23.52	23.9	43.05	31.48	22.9	55.19	15.22	23.0	38.65	10.68
24.6	25.32	41.06	24.8	34.34	23.40	24.9	43.33	31.26	23.9	55.26	14.90	24.0	38.60	10.36
25.6	25.51	41.25	25.8	34.55	23.29	25.9	43.60	31.06	24.9	55.35	14.61	25.0	38.58	10.05
26.6	25.68	41.43	26.8	34.75	23.20	26.9	43.85	30.88	25.9	55.44	14.34	26.0	38.57	9.77
27.6	25.85	41.59	27.8	34.94	23.10	27.9	44.08	30.70	26.9	55.52	14.07	27.0	38.55	9.50
28.6	26.01	41.73	28.8	35.11	22.98	28.9	44.28	30.52	27.9	55.59	13.82	28.0	38.53	9.25
29.6	26.18	41.86	29.8	35.29	22.85	29.9	44.48	30.31	28.9	55.65	13.58	29.0	38.49	9.01
30.6	26.38	41.99	30.8	35.47	22.70	30.9	44.70	30.08	29.9	55.69	13.33	30.0	38.45	8.76
31.6	26.60	42.12	31.8	35.66	22.54	31.9	44.93	29.84	30.9	55.73	13.05	31.0	38.40	8.49
32.6	26.82	42.28	32.8	35.87	22.38	32.9	45.18	29.59	31.9	55.77	12.75	32.0	38.34	8.20
	11.94	−11.90		11.08	−11.04		18.45	−18.42		12.26	−12.22		9.79	−9.74
	$1^h\ 42^m$	$13^s.66$		$5^h\ 46^m$	$49^s.81$		$7^h\ 17^m$	$21^s.00$		$9^h\ 9^m$	$22^s.33$		$10^h\ 59^m$	$56^s.35$
	−85° 12′	15″.81		−84° 49′	50″.68		−86° 53′	46″.93		−85° 19′	13″.38		−84° 7′	52″.51

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	1 42	−85 11	Sept.	5 46	−84 49	Sept.	7 16	−86 53	Sept.	9 8	−85 19	Sept.	10 59	−84 7
	s	″		s	″		s	″		s	″		s	″
1.6	26.82	42.28	1.8	35.87	22.38	1.9	45.18	29.59	1.9	55.82	12.43	1.0	38.34	68.20
2.6	27.04	42.48	2.8	36.10	22.23	2.9	45.45	29.34	2.9	55.90	12.10	2.0	38.29	67.89
3.6	27.26	42.68	3.8	36.35	22.10	3.9	45.75	29.10	3.9	55.99	11.77	3.0	38.24	67.56
4.6	27.47	42.90	4.8	36.60	21.99	4.8	46.08	28.87	4.9	56.10	11.46	4.0	38.21	67.22
5.6	27.67	43.15	5.8	36.85	21.91	5.8	46.43	28.67	5.9	56.23	11.15	5.0	38.20	66.88
6.6	27.85	43.40	6.8	37.10	21.85	6.8	46.79	28.49	6.9	56.37	10.86	5.9	38.20	66.54
7.6	28.01	43.66	7.8	37.34	21.81	7.8	47.15	28.33	7.9	56.52	10.59	6.9	38.22	66.20
8.6	28.16	43.92	8.8	37.57	21.78	8.8	47.50	28.18	8.9	56.67	10.34	7.9	38.25	65.88
9.6	28.30	44.17	9.8	37.80	21.75	9.8	47.82	28.04	9.9	56.81	10.10	8.9	38.27	65.58
10.6	28.43	44.40	10.8	38.02	21.72	10.8	48.13	27.91	10.9	56.95	9.86	9.9	38.30	65.29
11.6	28.56	44.62	11.8	38.23	21.69	11.8	48.44	27.78	11.9	57.08	9.63	10.9	38.33	65.01
12.6	28.69	44.83	12.8	38.43	21.65	12.8	48.73	27.65	12.9	57.19	9.39	11.9	38.35	64.73
13.6	28.84	45.03	13.8	38.63	21.60	13.8	49.01	27.50	13.9	57.30	9.15	12.9	38.37	64.46
14.6	28.99	45.23	14.8	38.84	21.53	14.8	49.29	27.33	14.9	57.41	8.90	13.9	38.37	64.19
15.6	29.15	45.44	15.8	39.06	21.45	15.8	49.58	27.15	15.9	57.52	8.63	14.9	38.37	63.91
16.6	29.33	45.67	16.8	39.30	21.38	16.8	49.91	26.97	16.9	57.64	8.35	15.9	38.37	63.61
17.6	29.50	45.93	17.8	39.54	21.33	17.8	50.26	26.80	17.9	57.79	8.05	16.9	38.37	63.29
18.6	29.66	46.20	18.7	39.79	21.30	18.8	50.63	26.64	18.9	57.96	7.77	17.9	38.39	62.96
19.6	29.81	46.49	19.7	40.05	21.29	19.8	51.03	26.51	19.9	58.14	7.50	18.9	38.43	62.62
20.6	29.93	46.81	20.7	40.31	21.32	20.8	51.44	26.41	20.9	58.34	7.26	19.9	38.49	62.28
21.6	30.03	47.12	21.7	40.56	21.38	21.8	51.84	26.33	21.9	58.55	7.05	20.9	38.56	61.96
22.6	30.10	47.42	22.7	40.80	21.45	22.8	52.21	26.28	22.9	58.75	6.87	21.9	38.64	61.66
23.6	30.17	47.70	23.7	41.01	21.51	23.8	52.56	26.24	23.9	58.94	6.70	22.9	38.73	61.38
24.6	30.23	47.96	24.7	41.21	21.57	24.8	52.90	26.19	24.9	59.12	6.53	23.9	38.82	61.13
25.6	30.30	48.20	25.7	41.40	21.61	25.8	53.22	26.13	25.9	59.28	6.36	24.9	38.90	60.89
26.6	30.40	48.43	26.7	41.60	21.64	26.8	53.53	26.05	26.9	59.43	6.18	25.9	38.96	60.65
27.6	30.50	48.67	27.7	41.81	21.65	27.8	53.85	25.96	27.9	59.60	5.97	26.9	39.01	60.40
28.6	30.61	48.93	28.7	42.03	21.65	28.8	54.19	25.85	28.9	59.77	5.75	27.9	39.06	60.13
29.5	30.73	49.20	29.7	42.27	21.66	29.8	54.56	25.74	29.9	59.95	5.53	28.9	39.11	59.84
30.5	30.85	49.49	30.7	42.52	21.69	30.8	54.95	25.64	30.9	60.14	5.29	29.9	39.17	59.54
31.5	30.96	49.81	31.7	42.77	21.73	31.8	55.37	25.55	31.9	60.36	5.05	30.9	39.24	59.22
32.5	31.05	50.15	32.7	43.03	21.80	32.8	55.80	25.49	32.8	60.59	4.84	31.9	39.33	58.91
11.94		−11.90	11.08		−11.04	18.44		−18.41	12.25		−12.21	9.79		−9.73
1h 42m		13s.66	5h 46m		49s.81	7h 17m		21s.00	9h 9m		22s.33	10h 59m		56s.35
−85° 12′		15″.81	−84° 49′		50″.68	−86° 53′		46″.93	−85° 19′		13″.38	−84° 7′		52″.51

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Oct.	1 42	−85 11	Oct.	5 46	−84 49	Oct.	7 16	−86 53	Oct.	9 9	−85 19	Oct.	10 59	−84
	s	″		s	″		s	″		s	″		s	″
1.5	30.96	49.81	1.7	42.77	21.73	1.8	55.37	25.55	1.9	0.36	5.05	1.9	39.33	58.9
2.5	31.05	50.15	2.7	43.03	21.80	2.8	55.80	25.49	2.8	0.59	4.84	2.9	39.43	58.6
3.5	31.13	50.49	3.7	43.29	21.90	3.8	56.23	25.45	3.8	0.83	4.65	3.9	39.55	58.2
4.5	31.19	50.83	4.7	43.54	22.03	4.8	56.66	25.44	4.8	1.09	4.48	4.9	39.67	58.0
5.5	31.22	51.18	5.7	43.77	22.17	5.8	57.09	25.44	5.8	1.34	4.33	5.9	39.81	57.73
6.5	31.24	51.52	6.7	43.99	22.31	6.8	57.50	25.46	6.8	1.59	4.20	6.9	39.95	57.4
7.5	31.25	51.84	7.7	44.20	22.46	7.8	57.89	25.49	7.8	1.83	4.08	7.9	40.08	57.2
8.5	31.26	52.14	8.7	44.41	22.60	8.8	58.26	25.53	8.8	2.06	3.96	8.9	40.21	57.0
9.5	31.28	52.43	9.7	44.61	22.72	9.8	58.63	25.55	9.8	2.28	3.85	9.9	40.33	56.8
10.5	31.30	52.71	10.7	44.81	22.84	10.8	58.98	25.56	10.8	2.49	3.73	10.9	40.45	56.59
11.5	31.33	52.98	11.7	45.01	22.95	11.7	59.32	25.56	11.8	2.69	3.60	11.9	40.55	56.37
12.5	31.37	53.24	12.7	45.20	23.05	12.7	59.66	25.55	12.8	2.89	3.46	12.9	40.65	56.14
13.5	31.42	53.52	13.7	45.40	23.15	13.7	60.02	25.54	13.8	3.10	3.31	13.9	40.76	55.89
14.5	31.47	53.83	14.7	45.62	23.26	14.7	60.41	25.52	14.8	3.32	3.17	14.9	40.88	55.63
15.5	31.51	54.16	15.7	45.85	23.39	15.7	60.82	25.52	15.8	3.56	3.01	15.9	41.01	55.36
16.5	31.53	54.51	16.7	46.09	23.54	16.7	61.25	25.54	16.8	3.83	2.87	16.9	41.16	55.10
17.5	31.53	54.87	17.7	46.32	23.72	17.7	61.70	25.60	17.8	4.11	2.76	17.9	41.32	54.85
18.5	31.51	55.24	18.7	46.54	23.93	18.7	62.13	25.69	18.8	4.40	2.68	18.9	41.50	54.63
19.5	31.47	55.59	19.7	46.74	24.16	19.7	62.54	25.80	19.8	4.68	2.62	19.9	41.68	54.43
20.5	31.41	55.90	20.7	46.93	24.40	20.7	62.92	25.92	20.8	4.96	2.59	20.9	41.87	54.25
21.5	31.35	56.20	21.7	47.10	24.63	21.7	63.27	26.05	21.8	5.22	2.58	21.9	42.04	54.10
22.5	31.28	56.49	22.7	47.26	24.85	22.7	63.60	26.17	22.8	5.46	2.56	22.9	42.20	53.95
23.5	31.23	56.77	23.7	47.41	25.04	23.7	63.92	26.27	23.8	5.69	2.53	23.9	42.36	53.81
24.5	31.19	57.03	24.6	47.57	25.22	24.7	64.25	26.36	24.8	5.91	2.49	24.9	42.50	53.65
25.5	31.17	57.29	25.6	47.74	25.38	25.7	64.59	26.43	25.8	6.13	2.43	25.9	42.64	53.47
26.5	31.16	57.57	26.6	47.93	25.55	26.7	64.94	26.49	26.8	6.36	2.36	26.9	42.78	53.27
27.5	31.15	57.88	27.6	48.12	25.73	27.7	65.31	26.55	27.8	6.61	2.28	27.9	42.93	53.07
28.5	31.12	58.21	28.6	48.32	25.93	28.7	65.70	26.63	28.8	6.88	2.21	28.9	43.10	52.86
29.5	31.08	58.55	29.6	48.52	26.15	29.7	66.11	26.74	29.8	7.17	2.15	29.9	43.28	52.66
30.5	31.03	58.89	30.6	48.72	26.39	30.7	66.53	26.87	30.8	7.47	2.11	30.8	43.48	52.47
31.5	30.96	59.24	31.6	48.91	26.66	31.7	66.95	27.02	31.8	7.77	2.09	31.8	43.69	52.29
32.5	30.87	59.58	32.6	49.09	26.95	32.7	67.35	27.19	32.8	8.06	2.10	32.8	43.90	52.14
	11.95	−11.90		11.08	−11.04		18.43	−18.41		12.25	−12.21		9.78	−9.73
	$1^h\ 42^m$	$13^s.66$		$5^h\ 46^m$	$49^s.81$		$7^h\ 17^m$	$21^s.00$		$9^h\ 9^m$	$22^s.33$		$10^h\ 59^m$	$56^s.35$
	−85° 12′	15″.81		−84° 49′	50″.68		−86° 53′	46″.93		−85° 19′	13″.38		−84° 7′	52″.51

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Nov.	1 42	−85 11	Nov.	5 46	−84 49	Nov.	7 17	−86 53	Nov.	9 9	−85 19	Nov.	10 59	−84 7
	s	''		s	''		s	''		s	''		s	''
1.5	30.87	59.58	1.6	49.09	26.95	1.7	7.35	27.19	1.8	8.06	2.10	1.8	43.90	52.14
2.5	30.76	59.92	2.6	49.26	27.24	2.7	7.73	27.37	2.8	8.36	2.13	2.8	44.12	52.01
3.5	30.64	60.24	3.6	49.41	27.54	3.7	8.09	27.57	3.8	8.65	2.17	3.8	44.34	51.89
4.5	30.52	60.54	4.6	49.56	27.83	4.7	8.43	27.77	4.8	8.93	2.22	4.8	44.56	51.79
5.4	30.40	60.83	5.6	49.69	28.11	5.7	8.75	27.96	5.8	9.19	2.27	5.8	44.77	51.70
6.4	30.29	61.10	6.6	49.81	28.37	6.7	9.06	28.14	6.8	9.44	2.32	6.8	44.96	51.61
7.4	30.19	61.35	7.6	49.92	28.62	7.7	9.36	28.31	7.8	9.68	2.36	7.8	45.14	51.52
8.4	30.10	61.60	8.6	50.04	28.86	8.7	9.64	28.48	8.7	9.92	2.40	8.8	45.31	51.43
9.4	30.01	61.86	9.6	50.17	29.09	9.7	9.94	28.63	9.7	10.16	2.43	9.8	45.49	51.33
10.4	29.92	62.13	10.6	50.31	29.33	10.7	10.26	28.78	10.7	10.40	2.45	10.8	45.67	51.22
11.4	29.83	62.41	11.6	50.46	29.58	11.7	10.60	28.94	11.7	10.66	2.47	11.8	45.87	51.10
12.4	29.73	62.71	12.6	50.61	29.85	12.7	10.95	29.11	12.7	10.94	2.50	12.8	46.08	50.98
13.4	29.62	63.02	13.6	50.76	30.15	13.7	11.31	29.31	13.7	11.24	2.55	13.8	46.30	50.87
14.4	29.48	63.34	14.6	50.90	30.49	14.7	11.67	29.55	14.7	11.54	2.64	14.8	46.53	50.78
15.4	29.32	63.65	15.6	51.02	30.84	15.7	12.01	29.82	15.7	11.83	2.75	15.8	46.78	50.72
16.4	29.14	63.93	16.6	51.12	31.20	16.6	12.32	30.10	16.7	12.12	2.89	16.8	47.02	50.69
17.4	28.94	64.19	17.6	51.20	31.55	17.6	12.60	30.39	17.7	12.39	3.04	17.8	47.26	50.69
18.4	28.75	64.43	18.6	51.27	31.88	18.6	12.84	30.67	18.7	12.64	3.20	18.8	47.49	50.70
19.4	28.57	64.64	19.6	51.32	32.20	19.6	13.06	30.94	19.7	12.87	3.36	19.8	47.70	50.72
20.4	28.41	64.84	20.6	51.37	32.50	20.6	13.27	31.18	20.7	13.09	3.51	20.8	47.90	50.73
21.4	28.26	65.04	21.6	51.43	32.78	21.6	13.49	31.42	21.7	13.31	3.63	21.8	48.09	50.73
22.4	28.11	65.25	22.6	51.51	33.05	22.6	13.72	31.64	22.7	13.54	3.73	22.8	48.28	50.71
23.4	27.97	65.47	23.6	51.60	33.32	23.6	13.97	31.85	23.7	13.77	3.84	23.8	48.48	50.68
24.4	27.83	65.71	24.6	51.69	33.61	24.6	14.25	32.08	24.7	14.02	3.95	24.8	48.69	50.64
25.4	27.67	65.97	25.6	51.79	33.93	25.6	14.54	32.32	25.7	14.28	4.06	25.8	48.92	50.59
26.4	27.50	66.23	26.6	51.88	34.27	26.6	14.83	32.58	26.7	14.56	4.19	26.8	49.15	50.56
27.4	27.32	66.50	27.6	51.96	34.61	27.6	15.12	32.87	27.7	14.85	4.34	27.8	49.39	50.55
28.4	27.12	66.76	28.6	52.04	34.98	28.6	15.40	33.17	28.7	15.12	4.52	28.8	49.64	50.56
29.4	26.90	67.01	29.6	52.10	35.36	29.6	15.66	33.49	29.7	15.39	4.72	29.8	49.90	50.59
30.4	26.67	67.24	30.5	52.15	35.74	30.6	15.90	33.81	30.7	15.66	4.93	30.8	50.15	50.64
31.4	26.44	67.45	31.5	52.18	36.11	31.6	16.11	34.15	31.7	15.91	5.16	31.8	50.40	50.71
	11.95	−11.91		11.09	−11.04		18.44	−18.41		12.25	−12.21		9.78	−9.73
	$1^{h}\ 42^{m}$	$13^{s}.66$		$5^{h}\ 46^{m}$	$49^{s}.81$		$7^{h}\ 17^{m}$	$21^{s}.00$		$9^{h}\ 9^{m}$	$22^{s}.33$		$10^{h}\ 59^{m}$	$56^{s}.35$
	−85° 12'	15''.81		−84° 49'	50''.68		−86° 53'	46''.93		−85° 19'	13''.38		−84° 7'	52''.51

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis. Mag. 5.6			**31 Mensæ.** Mag. 6.2			**7 Octantis.** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	1 42	−85 12	Dec.	5 46	−84 49	Dec.	7 17	−86 53	Dec.	9 9	−85 19	Dec.	10 59	−84 7
	s	″		s	″		s	″		s	″		s	″
1.4	26.44	7.45	1.5	52.18	36.11	1.6	16.11	34.15	1.7	15.91	5.16	1.8	50.40	50.71
2.4	26.21	7.64	2.5	52.20	36.47	2.6	16.29	34.49	2.7	16.14	5.39	2.8	50.64	50.79
3.4	25.98	7.81	3.5	52.21	36.82	3.6	16.46	34.80	3.7	16.36	5.62	3.8	50.87	50.88
4.4	25.77	7.97	4.5	52.21	37.15	4.6	16.60	35.11	4.7	16.56	5.84	4.8	51.08	50.97
5.4	25.56	8.11	5.5	52.20	37.47	5.6	16.74	35.41	5.7	16.76	6.05	5.8	51.28	51.06
6.4	25.36	8.25	6.5	52.21	37.77	6.6	16.87	35.69	6.7	16.95	6.25	6.7	51.47	51.14
7.4	25.17	8.40	7.5	52.23	38.06	7.6	17.02	35.97	7.7	17.14	6.44	7.7	51.67	51.21
8.4	24.98	8.57	8.5	52.25	38.37	8.6	17.19	36.24	8.7	17.35	6.63	8.7	51.87	51.26
9.4	24.79	8.74	9.5	52.27	38.69	9.6	17.38	36.52	9.7	17.57	6.82	9.7	52.08	51.32
10.4	24.58	8.93	10.5	52.30	39.04	10.6	17.58	36.82	10.7	17.81	7.02	10.7	52.31	51.38
11.3	24.35	9.13	11.5	52.32	39.40	11.6	17.77	37.15	11.7	18.05	7.26	11.7	52.56	51.46
12.3	24.10	9.32	12.5	52.33	39.79	12.6	17.94	37.51	12.7	18.30	7.53	12.7	52.81	51.57
13.3	23.83	9.49	13.5	52.31	40.19	13.6	18.09	37.89	13.7	18.53	7.81	13.7	53.06	51.70
14.3	23.55	9.64	14.5	52.27	40.59	14.6	18.21	38.27	14.7	18.75	8.12	14.7	53.31	51.87
15.3	23.27	9.75	15.5	52.21	40.97	15.6	18.29	38.66	15.6	18.94	8.44	15.7	53.54	52.06
16.3	22.99	9.83	16.5	52.14	41.34	16.6	18.33	39.04	16.6	19.11	8.76	16.7	53.76	52.25
17.3	22.72	9.90	17.5	52.07	41.68	17.6	18.36	39.38	17.6	19.27	9.07	17.7	53.96	52.45
18.3	22.47	9.96	18.5	52.00	41.99	18.6	18.39	39.71	18.6	19.42	9.35	18.7	54.15	52.63
19.3	22.24	10.02	19.5	51.94	42.29	19.6	18.43	40.02	19.6	19.56	9.61	19.7	54.33	52.79
20.3	22.02	10.09	20.5	51.89	42.58	20.6	18.48	40.33	20.6	19.71	9.87	20.7	54.51	52.95
21.3	21.80	10.17	21.5	51.84	42.88	21.6	18.55	40.63	21.6	19.87	10.13	21.7	54.70	53.09
22.3	21.58	10.28	22.5	51.81	43.20	22.6	18.64	40.94	22.6	20.05	10.38	22.7	54.91	53.22
23.3	21.34	10.40	23.5	51.78	43.54	23.5	18.74	41.28	23.6	20.24	10.65	23.7	55.12	53.37
24.3	21.08	10.51	24.5	51.74	43.89	24.5	18.83	41.64	24.6	20.43	10.94	24.7	55.34	53.53
25.3	20.82	10.62	25.5	51.69	44.26	25.5	18.92	42.01	25.6	20.62	11.24	25.7	55.57	53.70
26.3	20.54	10.72	26.5	51.63	44.64	26.5	18.99	42.39	26.6	20.81	11.57	26.7	55.80	53.89
27.3	20.26	10.81	27.5	51.55	45.03	27.5	19.04	42.78	27.6	20.99	11.91	27.7	56.03	54.11
28.3	19.96	10.87	28.5	51.45	45.40	28.5	19.05	43.18	28.6	21.15	12.26	28.7	56.25	54.34
29.3	19.66	10.91	29.5	51.35	45.76	29.5	19.04	43.57	29.6	21.29	12.62	29.7	56.46	54.59
30.3	19.37	10.93	30.5	51.23	46.10	30.5	19.00	43.96	30.6	21.41	12.98	30.7	56.66	54.85
31.3	19.08	10.94	31.5	51.11	46.43	31.5	18.95	44.33	31.6	21.52	13.33	31.7	56.85	55.11
32.3	18.81	10.93	32.5	50.98	46.74	32.5	18.88	44.68	32.6	21.62	13.67	32.7	57.02	55.38
	11.96	−11.92		11.09	−11.05		18.46	−18.43		12.25	−12.21		9.78	−9.73
	1h 42m	13s.66		5h 46m	49s.81		7h 17m	21s.00		9h 9m	22s.33		10h 59m	56s.35
−85° 12′		15″.81	−84° 49′		50″.68	−86° 53′		46″.93	−85° 19′		13″.38	−84° 7′		52″.51

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis.			**δ Octantis.**			**χ Octantis.**			**σ Octantis.**			**υ Octantis.**		
Mag. 5.4			Mag. 4.1			Mag. 5.2			Mag. 5.5			Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	12 45	−84 39	Jan.	14 12	−83 16	Jan.	18 3	−87 39	Jan.	19 21	−89 13	Jan.	22 15	−86 24
	s	″		s	″		s	″		s	″		s	″
0.8	43.29	6.58	0.8	52.06	18.36	0.9	54.81	58.34	1.0	38.58	61.71	1.1	27.96	40.28
1.8	43.54	6.64	1.8	52.26	18.29	1.9	54.99	58.02	2.0	38.57	61.39	2.1	27.74	40.03
2.7	43.79	6.70	2.8	52.46	18.22	2.9	55.18	57.70	3.0	38.56	61.05	3.1	27.51	39.79
3.7	44.04	6.76	3.8	52.66	18.16	3.9	55.38	57.38	4.0	38.56	60.69	4.1	27.26	39.55
4.7	44.31	6.83	4.8	52.88	18.10	4.9	55.61	57.04	5.0	38.59	60.32	5.1	27.00	39.29
5.7	44.58	6.91	5.8	53.11	18.04	5.9	55.86	56.69	6.0	38.70	59.95	6.1	26.74	39.01
6.7	44.87	7.01	6.8	53.34	18.00	6.9	56.14	56.34	7.0	38.92	59.57	7.1	26.49	38.70
7.7	45.16	7.14	7.8	53.58	17.99	7.9	56.47	56.00	8.0	39.26	59.18	8.1	26.27	38.37
8.7	45.44	7.30	8.8	53.82	18.00	8.9	56.83	55.67	9.0	39.73	58.78	9.1	26.07	38.03
9.7	45.71	7.48	9.8	54.06	18.04	9.9	57.22	55.36	10.0	40.31	58.40	10.1	25.90	37.69
10.7	45.96	7.67	10.8	54.29	18.10	10.9	57.62	55.08	11.0	40.97	58.05	11.1	25.75	37.36
11.7	46.19	7.87	11.8	54.50	18.18	11.9	58.01	54.81	11.9	41.65	57.72	12.1	25.62	37.03
12.7	46.41	8.06	12.8	54.70	18.25	12.9	58.40	54.56	12.9	42.30	57.41	13.1	25.51	36.72
13.7	46.63	8.23	13.8	54.90	18.32	13.9	58.76	54.32	13.9	42.89	57.10	14.1	25.39	36.43
14.7	46.85	8.40	14.8	55.09	18.37	14.9	59.08	54.08	14.9	43.40	56.80	15.1	25.25	36.16
15.7	47.07	8.55	15.8	55.29	18.41	15.9	59.39	53.82	15.9	43.85	56.49	16.1	25.09	35.88
16.7	47.30	8.69	16.8	55.49	18.43	16.9	59.70	53.53	16.9	44.26	56.15	17.1	24.91	35.58
17.7	47.55	8.83	17.8	55.70	18.44	17.9	60.03	53.22	17.9	44.66	55.79	18.1	24.72	35.27
18.7	47.81	8.99	18.8	55.93	18.46	18.9	60.39	52.90	18.9	45.13	55.41	19.1	24.53	34.94
19.7	48.09	9.18	19.8	56.17	18.50	19.9	60.80	52.58	19.9	45.74	55.02	20.1	24.35	34.58
20.7	48.37	9.39	20.8	56.42	18.56	20.9	61.25	52.26	20.9	46.49	54.63	21.1	24.19	34.20
21.7	48.64	9.63	21.8	56.67	18.65	21.9	61.74	51.95	21.9	47.36	54.25	22.1	24.06	33.81
22.7	48.89	9.89	22.8	56.91	18.77	22.9	62.24	51.68	22.9	48.34	53.89	23.1	23.96	33.42
23.7	49.12	10.15	23.8	57.14	18.90	23.9	62.75	51.44	23.9	49.37	53.55	24.1	23.88	33.04
24.7	49.33	10.41	24.7	57.36	19.05	24.9	63.25	51.21	24.9	50.40	53.24	25.1	23.82	32.68
25.7	49.53	10.66	25.7	57.56	19.19	25.9	63.72	51.00	25.9	51.39	52.94	26.1	23.76	32.34
26.7	49.73	10.90	26.7	57.76	19.32	26.9	64.17	50.80	26.9	52.31	52.65	27.1	23.70	32.01
27.7	49.92	11.13	27.7	57.96	19.45	27.9	64.61	50.60	27.9	53.17	52.30	28.1	23.63	31.69
28.7	50.12	11.35	28.7	58.15	19.56	28.9	65.04	50.38	28.9	53.98	52.07	29.1	23.55	31.38
29.7	50.32	11.57	29.7	58.34	19.66	29.9	65.46	50.14	29.9	54.78	51.77	30.1	23.46	31.05
30.7	50.54	11.79	30.7	58.54	19.75	30.9	65.88	49.89	30.9	55.57	51.45	31.1	23.36	30.71
31.7	50.76	12.00	31.7	58.76	19.85	31.9	66.32	49.63	31.9	56.37	51.12	32.1	23.24	30.36
32.7	50.99	12.23	32.7	58.98	19.95	32.9	66.79	49.37	32.9	57.23	50.77	33.1	23.13	30.00
	10.73	−10.68		8.54	−8.48		24.54	−24.52		74.64	−74.63		15.98	−15.94
	$12^h 45^m$	$49^s.27$		$14^h 13^m$	$0^s.04$		$18^h 4^m$	$24^s.69$		$19^h 22^m$	$55^s.65$		$22^h 15^m$	$31^s.59$
	$-84^\circ 39'$	$23''.48$		$-83^\circ 16'$	$30''.72$		$-87^\circ 39'$	$52''.84$		$-89^\circ 13'$	$50''.44$		$-86^\circ 24'$	$21''.39$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	**Right Ascension.**	**Declination *South*.**	**Mean Solar Date.**	**Right Ascension.**	**Declination *South*.**	**Mean Solar Date.**	**Right Ascension.**	**Declination *South*.**	**Mean Solar Date.**	**Right Ascension.**	**Declination *South*.**	**Mean Solar Date.**	**Right Ascension.**	**Declination *South*.**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	12 45	−84 39	Feb.	14 12	−83 16	Feb.	18 4	−87 39	Feb.	19 21	−89 13	Feb.	22 15	−86 24
	s	″		s	″		s	″		s	″		s	″
1.7	50.99	12.23	1.7	58.98	19.95	1.9	6.79	49.37	1.9	57.23	50.77	1.1	23.24	30.36
2.7	51.23	12.48	2.7	59.21	20.06	2.9	7.28	49.11	2.9	58.19	50.42	2.1	23.13	30.00
3.7	51.47	12.75	3.7	59.44	20.19	3.9	7.81	48.85	3.9	59.26	50.06	3.1	23.03	29.62
4.7	51.70	13.04	4.7	59.67	20.35	4.9	8.37	48.60	4.9	60.44	49.71	4.1	22.95	29.22
5.7	51.92	13.35	5.7	59.90	20.53	5.9	8.96	48.37	5.9	61.73	49.37	5.1	22.89	28.81
6.7	52.13	13.67	6.7	60.13	20.73	6.9	9.57	48.17	6.9	63.11	49.06	6.0	22.86	28.39
7.6	52.32	14.00	7.7	60.34	20.95	7.9	10.18	47.99	7.9	64.53	48.77	7.0	22.85	27.98
8.6	52.50	14.33	8.7	60.54	21.18	8.9	10.77	47.83	8.9	65.95	48.50	8.0	22.87	27.58
9.6	52.66	14.65	9.7	60.72	21.41	9.9	11.33	47.68	9.9	67.32	48.25	9.0	22.90	27.20
10.6	52.81	14.96	10.7	60.90	21.62	10.9	11.87	47.54	10.9	68.61	48.01	10.0	22.93	26.83
11.6	52.97	15.25	11.7	61.08	21.82	11.9	12.39	47.39	11.9	69.82	47.76	11.0	22.95	26.48
12.6	53.14	15.52	12.7	61.26	21.99	12.9	12.89	47.22	12.9	70.95	47.49	12.0	22.96	26.15
13.6	53.32	15.79	13.7	61.45	22.15	13.9	13.40	47.02	13.9	72.04	47.20	13.0	22.94	25.81
14.6	53.52	16.07	14.7	61.66	22.31	14.9	13.93	46.81	14.9	73.17	46.89	14.0	22.91	25.45
15.6	53.73	16.37	15.7	61.88	22.48	15.8	14.50	46.59	15.9	74.41	46.57	15.0	22.87	25.06
16.6	53.94	16.69	16.7	62.11	22.68	16.8	15.11	46.38	16.9	75.78	46.24	16.0	22.84	24.66
17.6	54.14	17.04	17.7	62.33	22.91	17.8	15.75	46.18	17.9	77.27	45.92	17.0	22.83	24.24
18.6	54.33	17.41	18.7	62.54	23.16	18.8	16.42	46.00	18.9	78.88	45.62	18.0	22.84	23.80
19.6	54.50	17.78	19.7	62.74	23.43	19.8	17.10	45.85	19.9	80.54	45.35	19.0	22.88	23.36
20.6	54.65	18.16	20.7	62.94	23.71	20.8	17.76	45.74	20.9	82.23	45.10	20.0	22.94	22.94
21.6	54.79	18.53	21.7	63.12	23.99	21.8	18.40	45.64	21.9	83.87	44.87	21.0	23.02	22.54
22.6	54.92	18.89	22.7	63.29	24.26	22.8	19.01	45.54	22.9	85.45	44.66	22.0	23.12	22.15
23.6	55.04	19.22	23.7	63.44	24.52	23.8	19.59	45.46	23.9	86.94	44.45	23.0	23.22	21.78
24.6	55.16	19.55	24.7	63.59	24.76	24.8	20.16	45.36	24.9	88.37	44.24	24.0	23.31	21.43
25.6	55.29	19.86	25.7	63.75	24.99	25.8	20.71	45.25	25.9	89.76	44.03	24.9	23.39	21.09
26.6	55.42	20.17	26.7	63.92	25.22	26.8	21.26	45.13	26.9	91.13	43.80	25.9	23.46	20.74
27.6	55.57	20.49	27.7	64.10	25.44	27.8	21.82	45.00	27.9	92.51	43.57	26.9	23.51	20.38
28.6	55.72	20.81	28.7	64.28	25.66	28.8	22.40	44.86	28.9	93.91	43.32	27.9	23.55	20.02
29.6	55.87	21.15	29.6	64.46	25.89	29.8	23.01	44.71	29.9	95.38	43.06	28.9	23.59	19.65
30.6	56.03	21.49	30.6	64.66	26.14	30.8	23.65	44.57	30.9	96.94	42.80	29.9	23.65	19.26
	10.73	−10.69		8.54	−8.48		24.52	−24.50		74.38	−74.37		15.96	−15.93
	12^h 45^m	$49^s.27$		14^h 13^m	$0^s.04$		18^h 4^m	$24^s.69$		19^h 22^m	$55^s.65$		22^h 15^m	$31^s.59$
	−84° 39′	23″.48		−83° 16′	30″.72		−87° 39′	52″.84		−89° 13′	50″.44		−86° 24′	21″.39

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	12 45	-84 39	Mar.	14 13	-83 16	Mar.	18 4	-87 39	Mar.	19 22	-89 13	Mar.	22 15	-86 24
	s	″		s	″		s	″		s	″		s	″
1.6	55.87	21.15	1.6	4.46	25.89	1.8	23.01	44.71	1.9	35.38	43.06	1.9	23.65	19.26
2.6	56.03	21.49	2.6	4.66	26.14	2.8	23.65	44.57	2.9	36.94	42.80	2.9	23.71	18.86
3.6	56.19	21.86	3.6	4.86	26.41	3.8	24.32	44.44	3.9	38.61	42.54	3.9	23.79	18.45
4.6	56.33	22.25	4.6	5.05	26.70	4.8	25.01	44.32	4.9	40.38	42.29	4.9	23.90	18.02
5.6	56.46	22.66	5.6	5.23	27.01	5.8	25.71	44.23	5.9	42.25	42.05	5.9	24.03	17.60
6.6	56.57	23.07	6.6	5.40	27.34	6.8	26.42	44.17	6.9	44.18	41.84	6.9	24.19	17.19
7.6	56.66	23.49	7.6	5.56	27.69	7.8	27.12	44.13	7.8	46.10	41.67	7.9	24.37	16.81
8.6	56.74	23.89	8.6	5.70	28.03	8.8	27.80	44.11	8.8	47.96	41.51	8.9	24.56	16.44
9.6	56.81	24.27	9.6	5.84	28.36	9.8	28.45	44.10	9.8	49.75	41.36	9.9	24.74	16.08
10.6	56.87	24.64	10.6	5.97	28.67	10.8	29.06	44.08	10.8	51.45	41.22	10.9	24.90	15.74
11.6	56.95	24.99	11.6	6.10	28.96	11.8	29.65	44.04	11.8	53.06	41.07	11.9	25.03	15.41
12.6	57.04	25.33	12.6	6.24	29.23	12.8	30.23	43.98	12.8	54.62	40.89	12.9	25.15	15.07
13.6	57.14	25.67	13.6	6.39	29.49	13.8	30.83	43.91	13.8	56.18	40.69	13.9	25.26	14.71
14.6	57.26	26.02	14.6	6.55	29.76	14.8	31.45	43.83	14.8	57.81	40.48	14.9	25.37	14.33
15.6	57.39	26.39	15.6	6.72	30.04	15.8	32.11	43.74	15.8	59.55	40.26	15.9	25.49	13.93
16.5	57.51	26.78	16.6	6.89	30.35	16.8	32.81	43.66	16.8	61.41	40.05	16.9	25.64	13.52
17.5	57.61	27.19	17.6	7.06	30.69	17.8	33.53	43.60	17.8	63.37	39.85	17.9	25.82	13.11
18.5	57.70	27.62	18.6	7.22	31.05	18.8	34.26	43.57	18.8	65.40	39.68	18.9	26.02	12.72
19.5	57.77	28.06	19.6	7.36	31.41	19.8	34.99	43.58	19.8	67.46	39.54	19.9	26.24	12.33
20.5	57.82	28.48	20.6	7.49	31.78	20.8	35.69	43.60	20.8	69.48	39.42	20.9	26.48	11.96
21.5	57.85	28.89	21.6	7.60	32.15	21.8	36.36	43.63	21.8	71.44	39.32	21.9	26.71	11.62
22.5	57.88	29.27	22.6	7.70	32.50	22.8	37.00	43.68	22.8	73.30	39.23	22.9	26.94	11.30
23.5	57.90	29.65	23.6	7.80	32.83	23.8	37.61	43.72	23.8	75.07	39.15	23.9	27.16	11.00
24.5	57.93	30.01	24.6	7.90	33.15	24.7	38.19	43.75	24.8	76.78	39.05	24.9	27.37	10.69
25.5	57.97	30.36	25.6	8.01	33.46	25.7	38.77	43.76	25.8	78.46	38.94	25.9	27.56	10.38
26.5	58.02	30.70	26.6	8.12	33.76	26.7	39.36	43.77	26.8	80.13	38.83	26.9	27.74	10.07
27.5	58.07	31.05	27.6	8.23	34.05	27.7	39.96	43.76	27.8	81.80	38.70	27.9	27.91	9.75
28.5	58.13	31.41	28.6	8.35	34.35	28.7	40.57	43.75	28.8	83.52	38.57	28.9	28.09	9.41
29.5	58.20	31.78	29.6	8.48	34.66	29.7	41.21	43.74	29.8	85.32	38.43	29.9	28.27	9.05
30.5	58.26	32.17	30.6	8.61	35.00	30.7	41.87	43.73	30.8	87.19	38.29	30.9	28.47	8.69
31.5	58.31	32.58	31.6	8.74	35.35	31.7	42.56	43.74	31.8	89.15	38.15	31.9	28.70	8.32
32.5	58.35	32.99	32.6	8.86	35.72	32.7	43.26	43.77	32.8	91.20	38.03	32.9	28.95	7.95
10.74		−10.69	8.54		−8.48	24.51		−24.49	74.21		−74.20	15.94		−15.91
$12^h\ 45^m$		$49^s.27$	$14^h\ 13^m$		$0^s.04$	$18^h\ 4^m$		$24^s.69$	$19^h\ 22^m$		$55^s.65$	$22^h\ 15^m$		$31^s.59$
−84° 39′		23″.48	−83° 16′		30″.72	−87° 39′		52″.84	−89° 13′		50″.44	−86° 24′		21″.39

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	12 45	−84 39	Apr.	14 13	−83 16	Apr.	18 4	−87 39	Apr.	19 23	−89 13	Apr.	22 15	−86 23
	s	″		s	″		s	″		s	″		s	″
1.5	58.35	32.99	1.6	8.86	35.72	1.7	43.26	43.77	1.8	31.20	38.03	1.9	28.95	67.95
2.5	58.37	33.42	2.6	8.97	36.10	2.7	43.97	43.83	2.8	33.31	37.94	2.9	29.22	67.60
3.5	58.38	33.85	3.6	9.07	36.50	3.7	44.66	43.91	3.8	35.44	37.88	3.9	29.52	67.27
4.5	58.37	34.28	4.6	9.16	36.90	4.7	45.34	44.01	4.8	37.53	37.84	4.9	29.83	66.95
5.5	58.35	34.68	5.6	9.23	37.29	5.7	45.99	44.13	5.8	39.53	37.82	5.9	30.14	66.66
6.5	58.33	35.06	6.6	9.29	37.65	6.7	46.59	44.25	6.8	41.44	37.81	6.9	30.43	66.39
7.5	58.31	35.42	7.5	9.35	38.00	7.7	47.16	44.35	7.8	43.24	37.79	7.9	30.70	66.13
8.5	58.30	35.76	8.5	9.42	38.33	8.7	47.72	44.43	8.8	44.96	37.75	8.9	30.95	65.86
9.5	58.30	36.10	9.5	9.49	38.65	9.7	48.30	44.49	9.8	46.67	37.69	9.9	31.18	65.58
10.5	58.31	36.45	10.5	9.58	38.96	10.7	48.89	44.54	10.8	48.41	37.61	10.9	31.40	65.28
11.5	58.34	36.82	11.5	9.68	39.29	11.7	49.51	44.58	11.8	50.23	37.52	11.9	31.63	64.96
12.5	58.37	37.21	12.5	9.78	39.64	12.7	50.16	44.63	12.8	52.16	37.43	12.9	31.88	64.62
13.5	58.38	37.62	13.5	9.88	40.01	13.7	50.84	44.69	13.7	54.19	37.35	13.9	32.15	64.28
14.5	58.38	38.04	14.5	9.97	40.40	14.7	51.53	44.78	14.7	56.30	37.30	14.9	32.45	63.95
15.5	58.36	38.46	15.5	10.05	40.80	15.7	52.22	44.90	15.7	58.44	37.28	15.9	32.78	63.64
16.5	58.32	38.87	16.5	10.11	41.21	16.7	52.89	45.04	16.7	60.55	37.28	16.9	33.12	63.36
17.5	58.27	39.27	17.5	10.16	41.61	17.7	53.52	45.20	17.7	62.60	37.30	17.9	33.47	63.09
18.5	58.21	39.64	18.5	10.19	41.99	18.7	54.11	45.37	18.7	64.54	37.33	18.9	33.81	62.85
19.5	58.14	40.00	19.5	10.22	42.36	19.7	54.66	45.53	19.7	66.39	37.38	19.9	34.14	62.63
20.5	58.07	40.34	20.5	10.25	42.72	20.7	55.18	45.69	20.7	68.15	37.43	20.8	34.45	62.42
21.5	58.01	40.67	21.5	10.28	43.06	21.7	55.69	45.84	21.7	69.84	37.47	21.8	34.75	62.21
22.4	57.96	40.99	22.5	10.32	43.38	22.7	56.20	45.97	22.7	71.50	37.48	22.8	35.03	61.99
23.4	57.92	41.31	23.5	10.36	43.69	23.7	56.72	46.09	23.7	73.16	37.49	23.8	35.31	61.77
24.4	57.89	41.63	24.5	10.41	44.01	24.7	57.25	46.20	24.7	74.85	37.49	24.8	35.58	61.53
25.4	57.86	41.97	25.5	10.46	44.34	25.7	57.80	46.31	25.7	76.59	37.48	25.8	35.86	61.28
26.4	57.83	42.31	26.5	10.51	44.68	26.7	58.37	46.43	26.7	78.39	37.48	26.8	36.16	61.03
27.4	57.79	42.67	27.5	10.56	45.04	27.7	58.96	46.56	27.7	80.27	37.48	27.8	36.47	60.77
28.4	57.74	43.04	28.5	10.61	45.41	28.7	59.56	46.70	28.7	82.23	37.49	28.8	36.80	60.50
29.4	57.68	43.43	29.5	10.65	45.80	29.6	60.18	46.87	29.7	84.25	37.53	29.8	37.15	60.25
30.4	57.60	43.81	30.5	10.68	46.20	30.6	60.78	47.06	30.7	86.28	37.59	30.8	37.52	60.01
31.4	57.51	44.19	31.5	10.69	46.60	31.6	61.37	47.27	31.7	88.28	37.68	31.8	37.91	59.80
	10.75	−10.70		8.54	−8.48		24.52	−24.50		74.13	−74.12		15.93	−15.90
	$12^{h}\ 45^{m}$	$49^{s}.27$		$14^{h}\ 13^{m}$	$0^{s}.04$		$18^{h}\ 4^{m}$	$24^{s}.69$		$19^{h}\ 22^{m}$	$55^{s}.65$		$22^{h}\ 15^{m}$	$31^{s}.59$
	−84° 39′	23″.48		−83° 16′	30″.72		−87° 39′	52″.84		−89° 13′	50″.44		−86° 24′	21″.39

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			δ Octantis. Mag. 4.1			χ Octantis. Mag. 5.2			σ Octantis. Mag. 5.5			υ Octantis. Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	12 45	−84 39	May	14 13	−83 16	May	18 5	−87 39	May	19 24	−89 13	May	22 15	−86 23
	s	″		s	″		s	″		s	″		s	″
1.4	57.51	44.19	1.5	10.69	46.60	1.6	1.37	47.27	1.7	28.28	37.68	1.8	37.91	59.80
2.4	57.40	44.55	2.5	10.69	47.00	2.6	1.92	47.50	2.7	30.21	37.79	2.8	38.30	59.61
3.4	57.28	44.89	3.5	10.69	47.37	3.6	2.43	47.74	3.7	32.04	37.91	3.8	38.69	59.44
4.4	57.17	45.21	4.5	10.67	47.72	4.6	2.91	47.96	4.7	33.76	38.02	4.8	39.05	59.29
5.4	57.06	45.50	5.5	10.66	48.05	5.6	3.36	48.16	5.7	35.38	38.12	5.8	39.37	59.14
6.4	56.97	45.78	6.5	10.66	48.36	6.6	3.80	48.34	6.7	36.94	38.20	6.8	39.68	58.98
7.4	56.90	46.07	7.5	10.67	48.67	7.6	4.25	48.51	7.7	38.51	38.27	7.8	39.98	58.81
8.4	56.83	46.37	8.5	10.69	48.98	8.6	4.73	48.66	8.7	40.13	38.32	8.8	40.28	58.61
9.4	56.77	46.69	9.5	10.71	49.31	9.6	5.25	48.81	9.7	41.83	38.35	9.8	40.59	58.40
10.4	56.70	47.03	10.5	10.73	49.65	10.6	5.80	48.97	10.7	43.63	38.39	10.8	40.91	58.18
11.4	56.62	47.37	11.5	10.75	50.01	11.6	6.35	49.16	11.7	45.53	38.46	11.8	41.26	57.97
12.4	56.52	47.73	12.5	10.75	50.39	12.6	6.90	49.38	12.7	47.48	38.56	12.8	41.64	57.77
13.4	56.40	48.08	13.5	10.74	50.78	13.6	7.44	49.62	13.7	49.39	38.68	13.8	42.05	57.59
14.4	56.27	48.42	14.4	10.72	51.17	14.6	7.94	49.88	14.7	51.24	38.82	14.8	42.46	57.44
15.4	56.13	48.73	15.4	10.68	51.54	15.6	8.40	50.15	15.7	53.00	38.98	15.8	42.87	57.32
16.4	55.98	49.02	16.4	10.64	51.89	16.6	8.82	50.42	16.7	54.64	39.16	16.8	43.26	57.22
17.4	55.83	49.29	17.4	10.59	52.22	17.6	9.20	50.68	17.7	56.18	39.33	17.8	43.63	57.14
18.4	55.68	49.55	18.4	10.54	52.53	18.6	9.56	50.93	18.7	57.64	39.49	18.8	43.98	57.05
19.4	55.54	49.79	19.4	10.49	52.82	19.6	9.92	51.17	19.7	59.03	39.64	19.8	44.32	56.96
20.4	55.41	50.02	20.4	10.45	53.11	20.6	10.29	51.39	20.6	60.40	39.78	20.8	44.65	56.87
21.4	55.29	50.25	21.4	10.42	53.39	21.6	10.66	51.60	21.6	61.78	39.91	21.8	44.97	56.77
22.4	55.18	50.50	22.4	10.39	53.67	22.6	11.04	51.81	22.6	63.19	40.04	22.8	45.29	56.66
23.4	55.07	50.75	23.4	10.37	53.96	23.6	11.44	52.02	23.6	64.65	40.16	23.8	45.62	56.54
24.4	54.96	51.02	24.4	10.35	54.27	24.6	11.85	52.24	24.6	66.19	40.28	24.8	45.96	56.42
25.4	54.84	51.30	25.4	10.33	54.60	25.6	12.28	52.47	25.6	67.78	40.40	25.8	46.32	56.29
26.4	54.70	51.58	26.4	10.30	54.93	26.6	12.71	52.72	26.6	69.43	40.55	26.7	46.70	56.17
27.4	54.55	51.87	27.4	10.26	55.28	27.6	13.14	53.00	27.6	71.11	40.72	27.7	47.10	56.07
28.3	54.39	52.16	28.4	10.20	55.63	28.6	13.55	53.29	28.6	72.76	40.92	28.7	47.52	55.99
29.3	54.21	52.43	29.4	10.13	55.97	29.6	13.93	53.60	29.6	74.34	41.14	29.7	47.94	55.93
30.3	54.02	52.68	30.4	10.05	56.30	30.6	14.26	53.92	30.6	75.82	41.38	30.7	48.35	55.89
31.3	53.83	52.90	31.4	9.96	56.61	31.6	14.55	54.23	31.6	77.18	41.62	31.7	48.74	55.87
32.3	53.65	53.10	32.4	9.87	56.89	32.6	14.82	54.52	32.6	78.43	41.85	32.7	49.11	55.86
	10.75	−10.71		8.55	−8.49		24.53	−24.51		74.17	−74.16		15.92	−15.89
	12h 45m	49s.27		14h 13m	0s.04		18h 4m	24s.69		19h 22m	55s.65		22h 15m	31s.59
	−84° 39′	23″.48		−83° 16′	30″.72		−87° 39′	52″.84		−89° 13′	50″.44		−86° 24′	21″.39

[Eph 14]

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			δ Octantis. Mag. 4.1			χ Octantis. Mag. 5.2			σ Octantis. Mag. 5.5			υ Octantis. Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	12 45	−84 39	June	14 13	−83 16	June	18 5	−87 39	June	19 25	−89 13	June	22 15	−86 23
	s	″		s	″		s	″		s	″		s	″
1.3	53.65	53.10	1.4	9.87	56.89	1.6	14.82	54.52	1.6	18.43	41.85	1.7	49.11	55.86
2.3	53.48	53.28	2.4	9.79	57.14	2.6	15.07	54.79	2.6	19.58	42.06	2.7	49.45	55.85
3.3	53.33	53.45	3.4	9.72	57.38	3.6	15.32	55.04	3.6	20.70	42.24	3.7	49.77	55.83
4.3	53.19	53.63	4.4	9.66	57.63	4.6	15.58	55.28	4.6	21.84	42.41	4.7	50.08	55.79
5.3	53.06	53.83	5.4	9.61	57.88	5.5	15.88	55.51	5.6	23.07	42.56	5.7	50.40	55.73
6.3	52.93	54.04	6.4	9.56	58.15	6.5	16.21	55.74	6.6	24.39	42.72	6.7	50.73	55.66
7.3	52.79	54.27	7.4	9.51	58.44	7.5	16.56	55.98	7.6	25.79	42.89	7.7	51.08	55.59
8.3	52.63	54.51	8.4	9.45	58.74	8.5	16.91	56.26	8.6	27.25	43.08	8.7	51.46	55.52
9.3	52.45	54.75	9.4	9.38	59.05	9.5	17.25	56.57	9.6	28.71	43.30	9.7	51.86	55.48
10.3	52.26	54.98	10.4	9.29	59.36	10.5	17.55	56.89	10.6	30.12	43.55	10.7	52.27	55.47
11.3	52.05	55.19	11.4	9.18	59.66	11.5	17.81	57.22	11.6	31.43	43.81	11.7	52.68	55.49
12.3	51.83	55.37	12.4	9.07	59.94	12.5	18.04	57.56	12.6	32.62	44.09	12.7	53.07	55.53
13.3	51.62	55.53	13.4	8.96	60.20	13.5	18.23	57.89	13.6	33.69	44.37	13.7	53.45	55.58
14.3	51.42	55.66	14.4	8.84	60.43	14.5	18.38	58.21	14.6	34.65	44.64	14.7	53.80	55.64
15.3	51.23	55.78	15.4	8.72	60.64	15.5	18.52	58.51	15.6	35.54	44.89	15.7	54.13	55.70
16.3	51.04	55.89	16.4	8.61	60.84	16.5	18.65	58.79	16.6	36.39	45.14	16.7	54.45	55.76
17.3	50.86	56.00	17.4	8.51	61.04	17.5	18.79	59.06	17.6	37.21	45.38	17.7	54.76	55.80
18.3	50.69	56.11	18.4	8.42	61.23	18.5	18.93	59.33	18.6	38.05	45.60	18.7	55.06	55.84
19.3	50.53	56.24	19.3	8.32	61.43	19.5	19.09	59.59	19.6	38.95	45.81	19.7	55.36	55.87
20.3	50.37	56.37	20.3	8.23	61.63	20.5	19.27	59.85	20.6	39.90	46.03	20.7	55.68	55.90
21.3	50.20	56.51	21.3	8.14	61.85	21.5	19.46	60.12	21.6	40.90	46.25	21.7	56.00	55.93
22.3	50.02	56.65	22.3	8.05	62.09	22.5	19.66	60.41	22.6	41.95	46.49	22.7	56.34	55.95
23.3	49.82	56.81	23.3	7.95	62.33	23.5	19.86	60.72	23.6	43.02	46.74	23.7	56.71	55.98
24.3	49.61	56.96	24.3	7.83	62.58	24.5	20.04	61.04	24.6	44.08	47.02	24.7	57.10	56.03
25.3	49.39	57.10	25.3	7.70	62.83	25.5	20.20	61.38	25.5	45.09	47.32	25.7	57.48	56.10
26.3	49.16	57.22	26.3	7.56	63.06	26.5	20.32	61.72	26.5	46.00	47.63	26.7	57.86	56.20
27.3	48.93	57.30	27.3	7.42	63.27	27.5	20.39	62.07	27.5	46.78	47.95	27.7	58.22	56.33
28.3	48.70	57.37	28.3	7.27	63.45	28.5	20.41	62.41	28.5	47.43	48.26	28.7	58.56	56.47
29.3	48.48	57.42	29.3	7.12	63.60	29.5	20.42	62.73	29.5	47.97	48.55	29.7	58.87	56.61
30.3	48.28	57.46	30.3	6.98	63.74	30.5	20.42	63.02	30.5	48.45	48.83	30.7	59.16	56.74
31.3	48.10	57.50	31.3	6.86	63.87	31.5	20.43	63.28	31.5	48.91	49.08	31.7	59.43	56.86
	10.76	−10.71		8.55	−8.49		24.56	−24.54		74.33	−74.32		15.92	−15.89
	$12^{h}\ 45^{m}$	$49^{s}.27$		$14^{h}\ 13^{m}$	$0^{s}.04$		$18^{h}\ 4^{m}$	$24^{s}.69$		$19^{h}\ 22^{m}$	$55^{s}.65$		$22^{h}\ 15^{m}$	$31^{s}.59$
	−84° 39′	23″.48		−83° 16′	30″.72		−87° 39′	52″.84		−89° 13′	50″.44		−86° 24′	21″.39

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι **Octantis.** Mag. 5.4			*δ* **Octantis.** Mag. 4.1			*χ* **Octantis.** Mag. 5.2			*σ* **Octantis.** Mag. 5.5			*υ* **Octantis.** Mag. 5.7		
Mean Solar Date.	**Right Ascension.**	**Declination** *South.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *South.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *South.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *South.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	12 45	−84 39	July	14 13	−83 17	July	18 5	−87 40	July	19 25	−89 13	July	22 15	−86 23
	s	″		s	″		s	″		s	″		s	″
1.3	48.10	57.50	1.3	6.86	3.87	1.5	20.43	3.28	1.5	48.91	49.08	1.7	59.43	56.86
2.3	47.93	57.55	2.3	6.75	4.00	2.5	20.47	3.54	2.5	49.44	49.32	2.6	59.68	56.95
3.3	47.76	57.61	3.3	6.65	4.14	3.5	20.53	3.80	3.5	50.06	49.54	3.6	59.95	57.03
4.2	47.59	57.68	4.3	6.54	4.30	4.5	20.62	4.07	4.5	50.76	49.78	4.6	60.24	57.10
5.2	47.41	57.77	5.3	6.43	4.48	5.5	20.71	4.35	5.5	51.52	50.03	5.6	60.55	57.17
6.2	47.21	57.85	6.3	6.31	4.67	6.5	20.81	4.66	6.5	52.30	50.31	6.6	60.88	57.26
7.2	46.99	57.93	7.3	6.17	4.86	7.5	20.89	4.99	7.5	53.04	50.61	7.6	61.23	57.38
8.2	46.76	58.00	8.3	6.02	5.04	8.5	20.92	5.33	8.5	53.70	50.93	8.6	61.58	57.53
9.2	46.52	58.05	9.3	5.86	5.21	9.5	20.90	5.68	9.5	54.24	51.26	9.6	61.92	57.70
10.2	46.29	58.07	10.3	5.69	5.35	10.5	20.84	6.02	10.5	54.66	51.60	10.6	62.23	57.89
11.2	46.05	58.06	11.3	5.53	5.46	11.5	20.75	6.35	11.5	54.96	51.93	11.6	62.52	58.10
12.2	45.82	58.04	12.3	5.36	5.55	12.4	20.64	6.66	12.5	55.15	52.25	12.6	62.79	58.30
13.2	45.61	58.00	13.3	5.20	5.63	13.4	20.52	6.95	13.5	55.29	52.55	13.6	63.04	58.49
14.2	45.41	57.95	14.3	5.05	5.70	14.4	20.41	7.22	14.5	55.40	52.84	14.6	63.28	58.68
15.2	45.22	57.91	15.3	4.91	5.76	15.4	20.29	7.48	15.5	55.51	53.11	15.6	63.50	58.86
16.2	45.04	57.87	16.3	4.77	5.81	16.4	20.19	7.73	16.5	55.64	53.38	16.6	63.71	59.03
17.2	44.86	57.84	17.3	4.64	5.88	17.4	20.10	7.98	17.5	55.81	53.64	17.6	63.94	59.20
18.2	44.69	57.82	18.3	4.51	5.96	18.4	20.03	8.24	18.5	56.04	53.90	18.6	64.17	59.36
19.2	44.51	57.82	19.3	4.37	6.05	19.4	19.97	8.51	19.5	56.32	54.17	19.6	64.42	59.51
20.2	44.31	57.81	20.3	4.23	6.16	20.4	19.91	8.79	20.5	56.63	54.45	20.6	64.68	59.67
21.2	44.09	57.81	21.3	4.08	6.27	21.4	19.84	9.09	21.5	56.95	54.75	21.6	64.95	59.84
22.2	43.87	57.80	22.3	3.92	6.37	22.4	19.75	9.40	22.5	57.23	55.08	22.6	65.24	60.04
23.2	43.64	57.78	23.3	3.75	6.47	23.4	19.63	9.73	23.5	57.43	55.42	23.6	65.53	60.26
24.2	43.41	57.73	24.3	3.57	6.55	24.4	19.48	10.06	24.5	57.51	55.76	24.6	65.80	60.50
25.2	43.18	57.65	25.3	3.38	6.59	25.4	19.28	10.38	25.5	57.45	56.11	25.6	66.04	60.76
26.2	42.96	57.55	26.2	3.20	6.61	26.4	19.04	10.67	26.5	57.27	56.45	26.6	66.25	61.03
27.2	42.75	57.44	27.2	3.03	6.61	27.4	18.79	10.94	27.5	57.00	56.75	27.6	66.44	61.28
28.2	42.56	57.32	28.2	2.87	6.60	28.4	18.54	11.18	28.5	56.69	57.03	28.6	66.60	61.52
29.2	42.39	57.20	29.2	2.72	6.58	29.4	18.30	11.40	29.5	56.40	57.29	29.6	66.75	61.74
30.2	42.23	57.10	30.2	2.59	6.57	30.4	18.10	11.60	30.5	56.18	57.53	30.6	66.89	61.94
31.2	42.07	57.01	31.2	2.46	6.57	31.4	17.92	11.81	31.5	56.04	57.77	31.6	67.05	62.14
32.2	41.91	56.94	32.2	2.33	6.59	32.4	17.76	12.04	32.4	55.97	58.03	32.6	67.24	62.33
	10.76	−10.71		8.55	−8.49		24.58	−24.56		74.55	−74.54		15.92	−15.89
	12h 45m	49s.27		14h 13m	0s.04		18h 4m	24s.69		19h 22m	55s.65		22h 15m	31s.59
	−84° 39′	23″.48		−83° 16′	30″.72		−87° 39′	52″.84		−89° 13′	50″.44		−86° 24′	21″.39

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Decli natio *South*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Aug.	12 45	−84 39	Aug.	14 12	−83 17	Aug.	18 5	−87 40	Aug.	19 25	−89 13	Aug.	22 16	−86 2
	s	″		s	″		s	″		s	″		s	″
1.2	41.91	56.94	1.2	62.33	6.59	1.4	17.76	12.04	1.4	55.97	58.03	1.6	7.24	2.3
2.2	41.73	56.87	2.2	62.19	6.62	2.4	17.61	12.30	2.4	55.97	58.30	2.6	7.44	2.5
3.2	41.54	56.81	3.2	62.03	6.67	3.4	17.44	12.57	3.4	55.95	58.59	3.6	7.66	2.7
4.2	41.33	56.73	4.2	61.87	6.71	4.4	17.24	12.86	4.4	55.86	58.91	4.6	7.89	2.9
5.2	41.11	56.63	5.2	61.69	6.72	5.4	17.00	13.15	5.4	55.66	59.24	5.6	8.11	3.2
6.2	40.88	56.50	6.2	61.50	6.72	6.4	16.72	13.44	6.4	55.33	59.58	6.6	8.30	3.5
7.2	40.67	56.35	7.2	61.31	6.70	7.4	16.40	13.72	7.4	54.88	59.91	7.6	8.47	3.8
8.2	40.47	56.18	8.2	61.13	6.65	8.4	16.05	13.98	8.4	54.31	60.22	8.5	8.62	4.1
9.1	40.28	55.99	9.2	60.95	6.57	9.4	15.69	14.21	9.4	53.67	60.51	9.5	8.74	4.4
10.1	40.11	55.80	10.2	60.79	6.49	10.4	15.33	14.42	10.4	52.99	60.79	10.5	8.84	4.7
11.1	39.94	55.61	11.2	60.63	6.40	11.4	14.98	14.61	11.4	52.30	61.05	11.5	8.92	5.0
12.1	39.79	55.43	12.2	60.48	6.30	12.4	14.64	14.79	12.4	51.63	61.30	12.5	8.99	5.2
13.1	39.65	55.25	13.2	60.34	6.21	13.4	14.31	14.97	13.4	51.00	61.55	13.5	9.07	5.5
14.1	39.51	55.08	14.2	60.20	6.13	14.4	14.00	15.14	14.4	50.41	61.78	14.5	9.16	5.7
15.1	39.36	54.92	15.2	60.06	6.06	15.4	13.71	15.32	15.4	49.89	62.01	15.5	9.26	6.0
16.1	39.21	54.77	16.2	59.92	6.00	16.4	13.43	15.52	16.4	49.41	62.26	16.5	9.37	6.2
17.1	39.05	54.63	17.2	59.78	5.96	17.3	13.15	15.73	17.4	48.95	62.53	17.5	9.50	6.5
18.1	38.87	54.48	18.2	59.62	5.91	18.3	12.85	15.96	18.4	48.48	62.81	18.5	9.64	6.7
19.1	38.69	54.32	19.2	59.45	5.86	19.3	12.52	16.20	19.4	47.95	63.10	19.5	9.77	7.0
20.1	38.50	54.14	20.2	59.28	5.79	20.3	12.16	16.43	20.4	47.32	63.40	29.5	9.89	7.3
21.1	38.32	53.94	21.2	59.11	5.70	21.3	11.76	16.66	21.4	46.56	63.70	21.5	9.99	7.7
22.1	38.14	53.71	22.2	58.94	5.58	22.3	11.32	16.87	22.4	45.66	63.99	22.5	10.06	8.0
23.1	37.98	53.46	23.2	58.77	5.44	23.3	10.86	17.05	23.4	44.65	64.25	23.5	10.10	8.37
24.1	37.84	53.20	24.2	58.61	5.28	24.3	10.41	17.20	24.4	43.58	64.49	24.5	10.11	8.68
25.1	37.73	52.95	25.2	58.47	5.11	25.3	9.98	17.33	25.4	42.52	64.70	25.5	10.10	8.97
26.1	37.63	52.71	26.2	58.34	4.94	26.3	9.57	17.44	26.4	41.52	64.89	26.5	10.09	9.24
27.1	37.52	52.49	27.2	58.22	4.79	27.3	9.18	17.55	27.4	40.62	65.07	27.5	10.09	9.50
28.1	37.41	52.28	28.2	58.11	4.65	28.3	8.82	17.67	28.4	39.81	65.26	28.5	10.10	9.75
29.1	37.30	52.09	29.2	58.00	4.53	29.3	8.48	17.80	29.4	39.06	65.45	29.5	10.13	9.99
30.1	37.17	51.90	30.2	57.87	4.42	30.3	8.13	17.95	30.4	38.32	65.67	30.5	10.18	10.24
31.1	37.04	51.70	31.2	57.73	4.31	31.3	7.75	18.12	31.4	37.53	65.91	31.5	10.24	10.5
32.1	36.89	51.48	32.1	57.57	4.19	32.3	7.34	18.29	32.4	36.64	66.16	32.5	10.29	10.83
10.76		−10.71	8.55		−8.49	24.61		−24.59	74.79		−74.78	15.93		−15.90
$12^{h}\ 45^{m}$		$49^{s}.27$	$14^{h}\ 13^{m}$		$0^{s}.04$	$18^{h}\ 4^{m}$		$24^{s}.69$	$19^{h}\ 22^{m}$		$55^{s}.65$	$22^{h}\ 15^{m}$		$31^{s}.59$
$-84^{\circ}\ 39'$		$23''.48$	$-83^{\circ}\ 16'$		$30''.72$	$-87^{\circ}\ 39'$		$52''.84$	$-89^{\circ}\ 13'$		$50''.44$	$-86^{\circ}\ 24'$		$21''.39$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	**Right Ascension.**	**Declination** *South.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *South.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *South.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *South.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Sept.	12 45	−84 39	Sept.	14 12	−83 16	Sept.	18 4	−87 40	Sept.	19 24	−89 14	Sept.	22 16	−86 24
	s	″		s	″		s	″		s	″		s	″
1.1	36.89	51.48	1.1	57.57	64.19	1.3	67.34	18.29	1.4	96.64	6.16	1.5	10.29	10.83
2.1	36.74	51.24	2.1	57.41	64.05	2.3	66.90	18.46	2.4	95.64	6.42	2.5	10.32	11.16
3.1	36.60	50.98	3.1	57.25	63.89	3.3	66.43	18.62	3.4	94.52	6.68	3.5	10.34	11.50
4.1	36.46	50.70	4.1	57.09	63.70	4.3	65.92	18.76	4.4	93.30	6.92	4.5	10.32	11.85
5.1	36.34	50.40	5.1	56.94	63.49	5.3	65.40	18.87	5.4	92.00	7.14	5.5	10.28	12.19
6.1	36.23	50.10	6.1	56.80	63.26	6.3	64.88	18.97	6.4	90.65	7.34	6.5	10.22	12.51
7.1	36.14	49.80	7.1	56.67	63.02	7.3	64.36	19.04	7.3	89.29	7.52	7.5	10.14	12.82
8.1	36.06	49.49	8.1	56.55	62.78	8.3	63.85	19.10	8.3	87.95	7.68	8.5	10.05	13.12
9.1	35.99	49.20	9.1	56.45	62.55	9.3	63.37	19.15	9.3	86.65	7.83	9.5	9.96	13.40
10.1	35.93	48.93	10.1	56.35	62.33	10.3	62.91	19.19	10.3	85.39	7.97	10.5	9.87	13.67
11.1	35.87	48.67	11.1	56.25	62.12	11.3	62.47	19.24	11.3	84.19	8.10	11.5	9.78	13.93
12.1	35.81	48.42	12.1	56.15	61.92	12.3	62.05	19.30	12.3	83.06	8.24	12.5	9.71	14.19
13.1	35.73	48.17	13.1	56.05	61.73	13.3	61.63	19.37	13.3	81.97	8.40	13.4	9.65	14.44
14.1	35.65	47.93	14.1	55.94	61.56	14.3	61.20	19.45	14.3	80.89	8.56	14.4	9.61	14.71
15.0	35.56	47.68	15.1	55.82	61.38	15.3	60.76	19.54	15.3	79.77	8.74	15.4	9.57	15.00
16.0	35.46	47.42	16.1	55.69	61.18	16.3	60.29	19.63	16.3	78.57	8.93	16.4	9.53	15.31
17.0	35.37	47.13	17.1	55.56	60.97	17.3	59.78	19.72	17.3	77.27	9.12	17.4	9.47	15.62
18.0	35.28	46.82	18.1	55.43	60.74	18.3	59.25	19.80	18.3	75.85	9.29	18.4	9.38	15.94
19.0	35.21	46.50	19.1	55.31	60.48	19.3	58.70	19.84	19.3	74.32	9.45	19.4	9.26	16.26
20.0	35.16	46.17	20.1	55.20	60.20	20.3	58.14	19.85	20.3	72.73	9.58	20.4	9.11	16.57
21.0	35.12	45.83	21.1	55.11	59.91	21.3	57.59	19.84	21.3	71.14	9.68	21.4	8.93	16.86
22.0	35.11	45.51	22.1	55.03	59.62	22.3	57.08	19.80	22.3	69.60	9.76	22.4	8.74	17.12
23.0	35.11	45.21	23.1	54.97	59.34	23.2	56.61	19.76	23.3	68.16	9.81	23.4	8.56	17.35
24.0	35.12	44.93	24.1	54.91	59.08	24.2	56.17	19.71	24.3	66.81	9.86	24.4	8.40	17.57
25.0	35.12	44.66	25.1	54.86	58.84	25.2	55.75	19.68	25.3	65.54	9.93	25.4	8.25	17.79
26.0	35.11	44.41	26.1	54.80	58.62	26.2	55.33	19.67	26.3	64.31	10.01	26.4	8.12	18.01
27.0	35.08	44.15	27.1	54.72	58.41	27.2	54.90	19.67	27.3	63.08	10.10	27.4	8.00	18.25
28.0	35.04	43.88	28.1	54.64	58.18	28.2	54.44	19.69	28.3	61.79	10.21	28.4	7.89	18.51
29.0	35.00	43.60	29.1	54.55	57.94	29.2	53.94	19.71	29.3	60.40	10.33	29.4	7.77	18.79
30.0	34.96	43.30	30.1	54.46	57.68	30.2	53.42	19.72	30.3	58.91	10.45	30.4	7.62	19.08
31.0	34.93	42.97	31.1	54.36	57.40	31.2	52.88	19.70	31.3	57.31	10.55	31.4	7.45	19.38
10.75		−10.70	8.55		−8.49	24.62		−24.60	74.97		−74.97	15.94		−15.91
$12^h\ 45^m$		$49^s.27$	$14^h\ 13^m$		$0^s.04$	$18^h\ 4^m$		$24^s.69$	$19^h\ 22^m$		$55^s.65$	$22^h\ 15^m$		$31^s.59$
−84° 39′		23″.48	−83° 16′		30″.72	−87° 39′		52″.84	−89° 13′		50″.44	−86° 24′		21″.39

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	12 45	−84 39	Oct.	14 12	−83 16	Oct.	18 4	−87 40	Oct.	19 24	−89 14	Oct.	22 15	−86 24
	s	″		s	″		s	″		s	″		s	″
1.0	34.93	42.97	1.1	54.36	57.40	1.2	52.88	19.70	1.3	57.31	10.55	1.4	67.45	19.38
2.0	34.91	42.62	2.1	54.28	57.10	2.2	52.31	19.66	2.3	55.62	10.64	2.4	67.25	19.67
2.9	34.91	42.27	3.1	54.21	56.78	3.2	51.75	19.60	3.3	53.89	10.70	3.4	67.03	19.95
3.9	34.93	41.92	4.1	54.15	56.46	4.2	51.21	19.52	4.3	52.16	10.74	4.4	66.79	20.21
4.9	34.97	41.58	5.1	54.11	56.13	5.2	50.67	19.42	5.3	50.44	10.76	5.4	66.54	20.45
5.9	35.01	41.26	6.1	54.07	55.80	6.2	50.15	19.31	6.3	48.77	10.76	6.4	66.29	20.68
6.9	35.06	40.95	7.0	54.04	55.48	7.2	49.67	19.20	7.3	47.17	10.75	7.4	66.04	20.90
7.9	35.12	40.64	8.0	54.02	55.18	8.2	49.22	19.08	8.3	45.65	10.73	8.4	65.80	21.10
8.9	35.17	40.35	9.0	54.00	54.90	9.2	48.78	18.97	9.3	44.20	10.71	9.4	65.57	21.29
9.9	35.22	40.08	10.0	53.97	54.63	10.2	48.35	18.87	10.3	42.81	10.71	10.4	65.36	21.47
10.9	35.26	39.82	11.0	53.94	54.36	11.2	47.94	18.78	11.3	41.45	10.72	11.4	65.15	21.66
11.9	35.29	39.55	12.0	53.91	54.10	12.2	47.52	18.70	12.3	40.09	10.73	12.4	64.96	21.86
12.9	35.31	39.28	13.0	53.87	53.84	13.2	47.08	18.64	13.2	38.69	10.75	13.4	64.77	22.07
13.9	35.34	38.99	14.0	53.83	53.57	14.2	46.61	18.57	14.2	37.19	10.78	14.4	64.57	22.30
14.9	35.37	38.68	15.0	53.79	53.28	15.2	46.12	18.49	15.2	35.60	10.81	15.4	64.34	22.55
15.9	35.40	38.36	16.0	53.75	52.97	16.2	45.60	18.39	16.2	33.94	10.82	16.4	64.08	22.78
16.9	35.46	38.04	17.0	53.73	52.64	17.2	45.08	18.25	17.2	32.22	10.80	17.4	63.79	23.00
17.9	35.55	37.71	18.0	53.72	52.30	18.2	44.58	18.08	18.2	30.47	10.74	18.4	63.48	23.20
18.9	35.66	37.39	19.0	53.73	51.95	19.2	44.11	17.89	19.2	28.77	10.66	19.4	63.16	23.37
19.9	35.78	37.09	20.0	53.75	51.62	20.2	43.67	17.68	20.2	27.17	10.55	20.3	62.84	23.51
20.9	35.90	36.81	21.0	53.78	51.31	21.2	43.28	17.46	21.2	25.69	10.44	21.3	62.54	23.63
21.9	36.02	36.56	22.0	53.82	51.01	22.2	42.93	17.26	22.2	24.31	10.33	22.3	62.25	23.74
22.9	36.14	36.32	23.0	53.85	50.73	23.2	42.59	17.09	23.2	23.01	10.23	23.3	61.99	23.85
23.9	36.24	36.09	24.0	53.88	50.48	24.2	42.25	16.93	24.2	21.74	10.15	24.3	61.74	23.97
24.9	36.32	35.86	24.9	53.90	50.23	25.2	41.89	16.78	25.2	20.45	10.08	25.3	61.50	24.11
25.9	36.40	35.61	25.9	53.90	49.97	26.2	41.50	16.64	26.2	19.09	10.03	26.3	61.26	24.26
26.9	36.48	35.35	26.9	53.91	49.69	27.2	41.09	16.49	27.2	17.63	9.98	27.3	61.00	24.42
27.9	36.57	35.07	27.9	53.91	49.39	28.2	40.66	16.34	28.2	16.09	9.92	28.3	60.72	24.59
28.9	36.67	34.77	28.9	53.92	49.07	29.1	40.21	16.16	29.2	14.47	9.84	29.3	60.42	24.76
29.9	36.78	34.46	29.9	53.94	48.74	30.1	39.76	15.95	30.2	12.81	9.75	30.3	60.09	24.92
30.9	36.91	34.16	30.9	53.97	48.40	31.1	39.31	15.72	31.2	11.14	9.63	31.3	59.75	25.06
31.9	37.06	33.86	31.9	54.01	48.06	32.1	38.89	15.48	32.2	9.49	9.48	32.3	59.39	25.18
	10.75	−10.70		8.55	−8.49		24.62	−24.60		75.03	−75.02		15.95	−15.92
	$12^{h}\ 45^{m}$	$49^{s}.27$		$14^{h}\ 13^{m}$	$0^{s}.04$		$18^{h}\ 4^{m}$	$24^{s}.69$		$19^{h}\ 22^{m}$	$55^{s}.65$		$22^{h}\ 15^{m}$	$31^{s}.59$
	−84° 39′	23″.48		−83° 16′	30″.72		−87° 39′	52″.84		−89° 13′	50″.44		−86° 24′	21″.39

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			δ Octantis. Mag. 4.1			χ Octantis. Mag. 5.2			σ Octantis. Mag. 5.5			υ Octantis. Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	12 45	−84 39	Nov.	14 12	−83 16	Nov.	18 4	−87 40	Nov.	19 23	−89 14	Nov.	22 15	−86 24
	s	″		s	″		s	″		s	″		s	″
1.9	37.22	33.58	1.9	54.07	47.72	1.1	38.89	15.48	1.2	69.49	9.48	1.3	59.39	25.18
2.9	37.39	33.31	2.9	54.14	47.39	2.1	38.50	15.23	2.2	67.91	9.32	2.3	59.03	25.28
3.9	37.56	33.06	3.9	54.22	47.09	3.1	38.14	14.97	3.2	66.40	9.15	3.3	58.68	25.36
4.9	37.73	32.84	4.9	54.30	46.80	4.1	37.81	14.70	4.2	64.98	8.97	4.3	58.33	25.42
5.9	37.89	32.63	5.9	54.38	46.52	5.1	37.50	14.44	5.2	63.65	8.78	5.3	58.00	25.47
6.9	38.05	32.43	6.9	54.45	46.26	6.1	37.22	14.19	6.2	62.41	8.60	6.3	57.68	25.51
7.9	38.20	32.24	7.9	54.52	46.01	7.1	36.96	13.96	7.2	61.23	8.43	7.3	57.38	25.56
8.9	38.34	32.04	8.9	54.58	45.77	8.1	36.70	13.74	8.2	60.07	8.28	8.3	57.10	25.61
9.9	38.48	31.83	9.9	54.64	45.52	9.1	36.42	13.52	9.2	58.90	8.14	9.3	56.82	25.67
10.9	38.62	31.61	10.9	54.70	45.26	10.1	36.12	13.31	10.2	57.68	8.00	10.3	56.53	25.75
11.9	38.77	31.38	11.9	54.76	44.98	11.1	35.81	13.10	11.2	56.39	7.86	11.3	56.23	25.83
12.9	38.93	31.14	12.9	54.83	44.67	12.1	35.48	12.87	12.2	55.02	7.71	12.3	55.91	25.92
13.9	39.11	30.90	13.9	54.91	44.36	13.1	35.14	12.61	13.2	53.59	7.53	13.3	55.57	26.00
14.9	39.31	30.67	14.9	55.01	44.05	14.1	34.81	12.32	14.2	52.15	7.32	14.3	55.21	26.06
15.9	39.53	30.46	15.9	55.13	43.74	15.1	34.51	12.01	15.2	50.74	7.09	15.3	54.83	26.08
16.9	39.76	30.28	16.9	55.26	43.46	16.1	34.26	11.69	16.2	49.42	6.84	16.3	54.44	26.07
17.9	40.00	30.12	17.9	55.40	43.21	17.1	34.05	11.36	17.2	48.24	6.57	17.3	54.07	26.03
18.9	40.22	29.99	18.9	55.54	42.98	18.1	33.88	11.03	18.1	47.20	6.30	18.3	53.73	25.98
19.9	40.43	29.87	19.9	55.66	42.76	19.1	33.74	10.72	19.1	46.27	6.04	19.3	53.40	25.92
20.9	40.62	29.75	20.9	55.77	42.56	20.1	33.63	10.43	20.1	45.41	5.79	20.3	53.09	25.87
21.9	40.80	29.62	21.9	55.88	42.36	21.1	33.51	10.17	21.1	44.57	5.56	21.3	52.80	25.83
22.9	40.98	29.48	22.9	55.98	42.15	22.1	33.36	9.91	22.1	43.69	5.35	22.3	52.52	25.82
23.9	41.16	29.32	23.9	56.09	41.92	23.1	33.18	9.66	23.1	42.73	5.15	23.3	52.22	25.81
24.9	41.35	29.15	24.9	56.19	41.67	24.1	32.98	9.41	24.1	41.69	4.94	24.3	51.92	25.81
25.9	41.55	28.97	25.9	56.30	41.41	25.1	32.77	9.13	25.1	40.57	4.72	25.2	51.60	25.81
26.8	41.77	28.79	26.9	56.43	41.14	26.1	32.54	8.83	26.1	39.40	4.49	26.2	51.25	25.80
27.8	42.00	28.62	27.9	56.57	40.88	27.1	32.33	8.51	27.1	38.24	4.23	27.2	50.89	25.77
28.8	42.25	28.46	28.9	56.72	40.62	28.1	32.14	8.17	28.1	37.10	3.95	28.2	50.52	25.73
29.8	42.50	28.32	29.9	56.88	40.36	29.1	31.98	7.83	29.1	36.03	3.65	29.2	50.14	25.67
30.8	42.76	28.20	30.9	57.04	40.13	30.1	31.86	7.47	30.1	35.04	3.34	30.2	49.77	25.58
31.8	43.02	28.10	31.9	57.21	39.93	31.1	31.77	7.11	31.1	34.16	3.02	31.2	49.41	25.47

10.74	−10.70	8.55	−8.49	24.60	−24.58	74.93	−74.92	15.96	−15.93
$12^h\ 45^m$	$49^s.27$	$14^h\ 13^m$	$0^s.04$	$18^h\ 4^m$	$24^s.69$	$19^h\ 22^m$	$55^s.65$	$22^h\ 15^m$	$31^s.59$
−84° 39′	23″.48	−83° 16′	30″.72	−87° 39′	52″.84	−89° 13′	50″.44	−86° 24′	21″.39

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	12 45	−84 39	Dec.	14 12	−83 16	Dec.	18 4	−87 39	Dec.	19 23	−89 13	Dec.	22 15	−86 24
	s	″		s	″		s	″		s	″		s	″
1.8	43.02	28.10	1.9	57.21	39.93	1.1	31.77	67.11	1.1	34.16	63.02	1.2	49.41	25.47
2.8	43.28	28.02	2.9	57.38	39.74	2.1	31.72	66.76	2.1	33.39	62.70	2.2	49.06	25.35
3.8	43.52	27.96	3.9	57.55	39.57	3.1	31.68	66.42	3.1	32.71	62.39	3.2	48.74	25.23
4.8	43.76	27.91	4.9	57.71	39.41	4.1	31.66	66.10	4.1	32.11	62.09	4.2	48.44	25.10
5.8	43.98	27.86	5.9	57.87	39.26	5.0	31.66	65.80	5.1	31.55	61.80	5.2	48.15	24.97
6.8	44.19	27.81	6.9	58.02	39.11	6.0	31.66	65.50	6.1	31.00	61.52	6.2	47.88	24.85
7.8	44.40	27.75	7.9	58.16	38.96	7.0	31.64	65.22	7.1	30.44	61.26	7.2	47.61	24.75
8.8	44.61	27.67	8.9	58.30	38.79	8.0	31.60	64.94	8.1	29.82	61.00	8.2	47.32	24.66
9.8	44.84	27.58	9.9	58.45	38.60	9.0	31.55	64.65	9.1	29.13	60.73	9.2	47.03	24.57
10.8	45.09	27.49	10.9	58.60	38.39	10.0	31.48	64.34	10.1	28.39	60.45	10.2	46.72	24.47
11.8	45.35	27.41	11.9	58.78	38.19	11.0	31.41	64.00	11.1	27.60	60.14	11.2	46.38	24.36
12.8	45.63	27.35	12.9	58.98	38.00	12.0	31.37	63.64	12.1	26.86	59.80	12.2	46.03	24.22
13.8	45.91	27.31	13.9	59.18	37.82	13.0	31.38	63.26	13.1	26.21	59.44	13.2	45.67	24.06
14.8	46.20	27.29	14.9	59.39	37.67	14.0	31.43	62.87	14.1	25.69	59.07	14.2	45.32	23.87
15.8	46.48	27.31	15.9	59.60	37.55	15.0	31.52	62.49	15.1	25.31	58.69	15.2	45.00	23.65
16.8	46.75	27.35	16.9	59.81	37.46	16.0	31.65	62.13	16.1	25.05	58.33	16.2	44.71	23.41
17.8	47.01	27.39	17.9	60.01	37.38	17.0	31.81	61.80	17.1	24.91	57.98	17.2	44.44	23.18
18.8	47.25	27.43	18.8	60.20	37.31	18.0	31.98	61.49	18.1	24.81	57.65	18.2	44.20	22.96
19.8	47.48	27.46	19.8	60.37	37.23	19.0	32.12	61.19	19.1	24.72	57.34	19.2	43.97	22.76
20.8	47.71	27.48	20.8	60.54	37.14	20.0	32.24	60.90	20.1	24.55	57.04	20.2	43.74	22.58
21.8	47.94	27.48	21.8	60.71	37.04	21.0	32.35	60.62	21.1	24.32	56.75	21.2	43.50	22.41
22.8	48.18	27.47	22.8	60.89	36.92	22.0	32.44	60.32	22.1	24.02	56.45	22.2	43.24	22.25
23.8	48.43	27.46	23.8	61.07	36.79	22.9	32.51	60.00	23.1	23.66	56.15	23.2	42.97	22.08
24.8	48.69	27.46	24.8	61.27	36.66	23.9	32.59	59.67	24.1	23.28	55.82	24.2	42.68	21.89
25.8	48.97	27.47	25.8	61.47	36.54	24.9	32.68	59.32	25.0	22.93	55.46	25.2	42.38	21.68
26.8	49.25	27.49	26.8	61.68	36.42	25.9	32.80	58.96	26.0	22.63	55.09	26.2	42.07	21.47
27.8	49.54	27.54	27.8	61.90	36.32	26.9	32.95	58.59	27.0	22.42	54.71	27.2	41.77	21.24
28.8	49.83	27.61	28.8	62.13	36.25	27.9	33.14	58.22	28.0	22.31	54.32	28.2	41.48	20.98
29.8	50.11	27.69	29.8	62.36	36.20	28.9	33.36	57.86	29.0	22.30	53.93	29.2	41.21	20.70
30.8	50.39	27.80	30.8	62.59	36.17	29.9	33.61	57.52	30.0	22.41	53.55	30.2	40.96	20.42
31.8	50.65	27.92	31.8	62.81	36.16	30.9	33.87	57.19	31.0	22.62	53.19	31.2	40.73	20.13
32.8	50.90	28.06	32.8	63.01	36.16	31.9	34.16	56.88	32.0	22.88	52.84	32.1	40.53	19.84
	10.74	−10.69		8.54	−8.48		24.57	−24.55		74.70	−74.69		15.96	−15.02
	$12^{h}\ 45^{m}$	$49^{s}.27$		$14^{h}\ 13^{m}$	$0^{s}.04$		$18^{h}\ 4^{m}$	$24^{s}.69$		$19^{h}\ 22^{m}$	$55^{s}.65$		$22^{h}\ 15^{m}$	$31^{s}.59$
	−84° 39′	23″.48		−83° 16′	30″.72		−87° 39′	52″.84		−89° 13′	50″.44		−86° 24′	21″.39

MEAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.	
					α	δ						α	δ
		h	m	°	s	″			h	m	°	s	″
1	33 Piscium	0	1	− 6	.018	.25	109	ε Sculpt.	1	42	−25	.037	.46
3	α Androm.		4	+29	.010	.13	116	ζ Ceti		48	−11	.020	.24
4	β Cassiop.		5	+59	.017	.17	118	α Trianguli		49	+29	.022	.22
5	ε Phœnicis		5	−46	.051	.41	117	ε Cassiop.		49	+63	.017	.17
6	22 Androm.		6	+46	.024	.28	120	ξ Piscium		49	+ 3	.018	.23
10	γ Pegasi	0	9	+15	.011	.14	121	β Arietis	1	50	+20	.013	.20
14	σ Androm.		14	+36	.029	.33	122	ψ Phœnicis		50	−47	.080	.81
15	ι Ceti		15	− 9	.014	.20	127	υ Ceti		56	−21	.025	.32
16	ζ Tucanæ		16	−65	.047	.38	129	α Hydri		56	−62	.049	.34
19	44 Piscium		21	+ 1	.018	.22	126	50 Cassiop.		57	+72	.016	.17
20	β Hydri	0	22	−78	....	...	131	γ Andr. *pr.*	1	59	+42	.016	.16
21	α Phœnicis		22	−43	.047	.31	133	α Arietis	2	3	+23	.010	.14
23	12 Ceti		26	− 4	.017	.21	134	β Trianguli		5	+35	.018	.21
30	13 Ceti		31	− 4	.023	.30	136	55 Cassiop.		8	+66	.025	.24
31	ζ Cassiop.		33	+53	.021	.20	137	6 Persei		8	+51	.025	.27
32	π Androm.	0	33	+33	.021	.21	138	ξ¹ Ceti	2	9	+ 8	.018	.23
35	ε Androm.		34	+29	.016	.19	139	μ Fornacis		9	−31	.076	.83
36	δ Androm.		35	+30	.018	.22	141	γ Trianguli		13	+33	.024	.31
37	α Cassiop.		36	+56	.012	.14	142	67 Ceti		13	− 7	.021	.25
38	μ Phœnicis		38	−47	....	.53	144	φ Eridani		14	−52	.049	.42
39	β Ceti	0	40	−18	.013	.17	145	ο Ceti	2	15	− 3	.018	.23
42	ο Cassiop.		40	+48	.034	.26	146	κ Fornacis		19	−24	.049	.47
41	21 Cassiop.		40	+75	.017	.24	148	δ Hydri		20	−69	....	...
45	ζ Androm.		43	+24	.019	.24	149	ι Cassiop.		22	+67	.025	.25
46	η Cassiop.		44	+57	.017	.24	153	ξ² Ceti		24	+ 8	.014	.19
49	δ Piscium	0	45	+ 7	.014	.20	156	σ Ceti	2	28	−16	.028	.37
52	λ Hydri		46	−75	....	.70	157	36 H. Cassiop.		30	+72	.021	.22
53	20 Ceti		49	− 2	.018	.26	160	ν Ceti		32	+ 5	.020	.26
54	γ Cassiop.		52	+60	.018	.22	163	μ Hydri		33	−79	.056	.70
55	μ Androm.		52	+38	.017	.21	161	ν Arietis		34	+22	.020	.26
58	α Sculptoris	0	55	−30	.025	.23	165	δ Ceti	2	35	− 0	.014	.20
59	43 H. Cephei		58	+86	.010	.17	172	ε Hydri		38	−69	....	...
61	ε Piscium	0	59	+ 7	.012	.26	170	θ Persei		39	+49	.021	.19
66	β Phœnicis	1	3	−47	.050	.47	173	γ Ceti *seq.*		39	+ 3	.016	.20
65	μ Cassiop.		3	+55	.022	.27	174	π Ceti		40	−14	.025	.25
69	η Ceti	1	5	−11	.025	.22	175	μ Ceti	2	41	+10	.020	.21
71	β Androm.		5	+35	.013	.17	177	η Persei		45	+56	.010	.25
74	τ Piscium		7	+30	.019	.33	178	41 Arietis		45	+27	.020	.22
76	ζ Piscium		10	+ 7	.019	.24	179	β Fornacis		46	−33	.050	.47
78	κ Tucanæ		13	−69	....	...	180	σ Arietis		47	+15	.018	.24
79	*f* Piscium	1	14	+ 3	.022	.29	181	τ² Eridani	2	47	−21	.022	.32
80	υ Piscium		15	+27	.022	.25	182	τ Persei		49	+52	.020	.19
85	θ Ceti		20	− 9	.013	.19	183	η Eridani		53	− 9	.016	.21
86	δ Cassiop.		21	+60	.018	.19	185	ε Arietis		55	+21	.016	.23
91	γ Phœnicis		25	−44	.044	.35	187	θ Eridani		55	−41	.056	.42
90	38 Cassiop.	1	25	+70	.026	.28	184	47 H. Cephei	2	55	+79	.035	.32
94	η Piscium		27	+15	.020	.19	189	α Ceti		58	+ 4	.010	.13
89	α Urs. Min.		32	+89	....	...	191	τ³ Eridani		59	−24	.029	.32
96	40 Cassiop.		32	+73	.028	.25	190	γ Persei	2	59	+53	.029	.20
97	υ Androm.		32	+41	.024	.26	192	ρ Persei	3	0	+39	.019	.24
98	π Piscium	1	33	+12	.022	.25	194	μ Horologii	3	2	−60	.060	.49
99	υ Persei		33	+48	.018	.19	197	θ Hydri		2	−72	.046	.47
101	α Eridani		35	−58	....	...	195	β Persei		3	+41	.016	.20
103	ω Cassiop.		36	+68	.025	.25	199	δ Arietis		7	+19	.014	.17
104	ν Piscium		37	+ 5	.014	.20	202	12 Eridani		9	−29	.022	.30
105	φ Persei	1	39	+50	.022	.20	200	48 H. Cephei	3	10	+77	.032	.32
107	τ Ceti		40	−16	.020	.25	203	ζ Arietis		10	+21	.018	.29
108	ο Piscium		41	+ 9	.013	.19	204	38 Horologii(G.)		11	−58	....	...
112	4 Octantis(G.)	1	42	−85	.039	.40	206	ζ Eridani	3	12	− 9	.022	.31

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Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Err 1920.	
					α	δ						α	δ
		h	m	°	s	″			h	m	°	s	″
209	τ Arietis	3	17	+21	.027	.32	319	η Aurigæ	5	1	+41	.021	.2
210	ε Eridani		17	−43	.056	.49	320	ε Leporis		2	−22	.021	.2
212	ι Hydri		18	−78	....	...	322	β Eridani		4	− 5	.016	.2
211	α Persei		19	+50	.013	.14	327	μ Aurigæ		8	+38	.028	.2
213	ο Tauri		21	+ 9	.014	.21	328	μ Leporis		9	−16	.032	.3
214	2 H. Camel.	3	23	+60	.028	.37	326	19 H.Camel.	5	9	+79	.025	.3
215	ξ Tauri		23	+ 9	.023	.22	330	β Orionis		11	− 8	.009	.1
219	f Tauri		26	+13	.016	.22	329	α Aurigæ		11	+46	.012	.1
221	ε Eridani		29	−10	.014	.17	332	λ Aurigæ		14	+40	.027	.2
222	τ^{5} Eridani		30	−22	.031	.40	333	τ Orionis		14	− 7	.014	.2
230	δ Persei	3	37	+48	.016	.16	335	ο Columbæ	5	15	−35	.068	.6
235	δ Eridani		39	−10	.020	.24	342	γ Orionis		21	+ 6	.017	.2
234	ν Persei		40	+42	.024	.25	343	β Tauri		21	+29	.010	.1
237	5 H. Camel.		42	+71	.025	.29	344	17 Camelop.		23	+63	.029	.2
238	η Tauri		43	+24	.014	.17	347	β Leporis		25	−21	.025	.3
239	τ^{6} Eridani	3	43	−23	.023	.30	348	χ Aurigæ	5	28	+32	.022	.3
243	g Eridani		46	−36	.073	.63	350	δ Orionis		28	− 0	.012	.1
246	γ Hydri		48	−74	.031	.29	349	Gr. 966		29	+75	.022	.2
244	ζ Persei		49	+32	.019	.22	354	α Leporis		29	−18	.018	.2
245	9 H. Camel.		50	+61	.031	.33	355	ϕ^{1} Orionis		30	+ 9	.021	.3
248	ε Persei	3	52	+40	.019	.22	359	ι Orionis	5	32	− 6	.022	.2
250	ξ Persei		54	+36	.019	.22	361	ε Orionis		32	− 1	.013	.1
251	γ Eridani		54	−14	.017	.19	362	ζ Tauri		33	+21	.019	.2
252	λ Tauri		56	+12	.018	.22	356	Gr. 944		36	+85	.030	.3
254	δ Reticuli		57	−62	.044	.36	366	ζ Orionis		37	− 2	.016	.1
255	ν Tauri	3	59	+ 6	.018	.22	368	α Columbæ	5	37	−34	.024	.2
256	A Tauri	4	0	+22	.020	.23	369	ο Aurigæ		40	+50	.028	.3
260	c Persei		3	+47	.020	.22	372	ζ Leporis		43	−15	.023	.3
263	p Tauri		6	+26	.030	.37	373	κ Orionis		44	−10	.013	.1
265	o^{1} Eridani		8	− 7	.016	.23	375	δ Doradus		45	−66	....	...
264	Gr. 750	4	11	+85	.017	.24	381	31 Mensæ (G.)	5	46	−85	.042	.56
268	μ Tauri		11	+ 9	.027	.47	374	ν Aurigæ		46	+39	.021	.36
270	α Horologii		11	−42	.073	.69	378	δ Leporis		48	−21	.036	.37
271	α Reticuli		13	−63	.061	.54	382	α Orionis		51	+ 7	.008	.14
274	γ Tauri		15	+15	.013	.21	385	η Leporis		53	−14	.022	.22
277	δ Tauri	4	18	+17	.017	.23	383	δ Aurigæ	5	53	+54	.026	.25
279	υ^{5} Eridani		21	−34	.046	.42	387	β Aurigæ		54	+45	.016	.16
284	δ Mensæ		23	−80	.058	.52	388	θ Aurigæ		54	+37	.020	.20
281	ε Tauri		24	+19	.013	.20	393	1 Gemin.	5	59	+23	.021	.30
285	m Persei		28	+43	.031	.34	395	1 Puppis (G.)	6	2	−45	.057	.55
288	α Tauri	4	31	+16	.009	.13	396	ν Orionis	6	3	+15	.016	.19
291	α Doradus		32	−55	.054	.40	402	22 H.Camel.		10	+69	.022	.26
289	ν Eridani		32	− 4	.018	.24	405	η Gemin.		10	+23	.014	.20
292	53 Eridani		35	−14	.023	.28	406	2 Lyncis		13	+59	.023	.22
296	τ Tauri		37	+23	.014	.23	411	ζ Can. Maj.		17	−30	.055	.44
297	α Cœli	4	38	−42	.050	.46	412	μ Gemin.	6	18	+23	.013	.17
294	Gr. 848		38	+76	.024	.30	413	ψ^{1} Aurigæ		19	+49	.025	.23
298	4 Camelop.		41	+57	.027	.25	414	β Can. Maj.		19	−18	.019	.22
299	μ Eridani		42	− 3	.016	.21	415	8 Monoc.		20	+ 5	.022	.24
303	π^{3} Orionis		45	+ 7	.021	.22	416	α Argûs		22	−53	....	...
302	9 Camelop.	4	46	+66	.021	.19	418	10 Monoc.	6	24	− 5	.017	.37
304	i Tauri		47	+19	.023	.31	419	ν Gemin.		24	+20	.027	.21
307	π^{5} Orionis		50	+ 2	.016	.22	423	8 Lyncis		30	+62	.022	.23
309	ι Aurigæ		52	+33	.014	.17	425	ξ^{2} Can. Maj.		32	−23	.034	.35
313	ε Aurigæ		56	+44	.021	.19	424	23 H.Camel.		33	+80	.024	.29
312	β Camelop.	4	56	+60	.023	.19	427	γ Gemin.	6	33	+16	.013	.17
314	ζ Aurigæ		57	+41	.017	.22	426	51 Aurigæ		33	+39	.025	.31
316	ι Tauri	4	58	+21	.019	.26	429	ν Argûs		35	−43	.058	.48
318	11 Orionis	5	0	+15	.020	.35	430	S Monoc.	6	37	+10	.016	.22

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Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.	
					a	δ						a	δ
		h	m	°	s	"			h	m	°	s	"
[illegible]	ε Gemin.	6	39	+25	.014	.19	536	30 Monoc.	8	22	− 4	.017	.23
[illegible]	ξ Gemin.		41	+13	.013	.21	539	θ Chamæl.		23	−77	.050	.40
[illegible]	ψ^5 Aurigæ		41	+44	.029	.24	537	ο Urs. Maj.		24	+61	.014	.15
[illegible]	α Can. Maj.		42	−17	....	.16	543	Gr. 1450		28	+38	.047	.43
[illegible]	18 Monoc.		44	+ 3	.020	.25	544	η Cancri		28	+21	.019	.20
[illegible]	43 Camelop.	6	45	+69	.027	.24	545	Gr. 1446	8	31	+74	.032	.38
[illegible]	ζ Mensæ		47	−81	.048	.47	547	δ Hydræ		33	+ 6	.019	.26
[illegible]	α Pictoris		47	−62	.061	.63	548	σ Hydræ		35	+ 4	.023	.27
[illegible]	θ Gemin.		48	+34	.020	.22	554	γ Cancri		39	+22	.016	.21
[illegible]	τ Argûs		48	−51	.069	.64	556	δ Cancri		40	+18	.017	.21
[illegible]	15 Lyncis	6	50	+59	.023	.21	557	α Pyxidis	8	40	−33	.053	.42
[illegible]	θ Can. Maj.		50	−12	.021	.31	558	ι Cancri		42	+29	.025	.26
[illegible]	ε Can. Maj.		55	−29	.017	.23	560	δ Argûs		42	−54	.053	.41
454	ζ Gemin.	6	59	+21	.016	.19	559	ε Hydræ		43	+ 7	.014	.19
455	o^2 Can. Maj.	7	0	−24	.025	.29	566	σ^2 Cancri		49	+31	.022	.31
456	γ Can. Maj.	7	0	−16	.021	.28	567	ζ Hydræ	8	51	+ 6	.018	.24
449	51 H. Cephei		4	+87	....	...	569	ι Urs. Maj.		54	+48	.016	.17
460	δ Can. Maj.		5	−26	.020	.24	571	α Cancri		54	+12	.015	.20
461	63 Aurigæ		6	+39	.021	.26	574	b^1 Carinæ		55	−59	.044	.43
464	51 Gemin.		9	+16	.023	.37	576	κ Urs. Maj.	8	58	+47	.018	.19
465	γ^2 Volantis	7	9	−70	.071	.64	582	σ^2 Urs. Maj.	9	3	+67	.020	.28
469	λ Gemin.		13	+17	.013	.22	583	κ Cancri		3	+11	.016	.22
470	π Argûs		14	−37	.046	.34	585	λ Argûs		5	−43	.039	.32
467	25 H. Camel.		14	+83	.025	.24	590	ζ Octantis		9	−85	.041	.38
[illegible]	7 Octant. (G.)		15	−87	.053	.46	589	θ Hydræ		10	+ 3	.014	.19
471	δ Gemin.	7	15	+22	.014	.17	591	β Argûs	9	12	−69	.035	.28
474	δ Volantis		17	−68	.061	.64	593	83 Cancri		15	+18	.018	.24
476	ι Gemin.		21	+28	.014	.22	594	ι Argûs		15	−59	....	...
477	η Can. Maj.		21	−29	.021	.25	595	40 Lyncis		16	+35	.018	.21
478	Gr. 1308		23	+69	.028	.26	596	θ Pyxidis		18	−26	.046	.61
479	β Can. Min.	7	23	+ 8	.014	.19	599	α Hydræ	9	24	− 8	.010	.15
481	ρ Gemin.		24	+32	.021	.27	601	h Urs. Maj.		25	+63	.019	.19
483	σ Argûs		27	−43	.060	.46	600	1 H. Draco.		26	+82	.016	.20
484	α^2 Gemin.		29	+32	.019	.14	603	d Urs. Maj.		27	+70	.025	.24
488	25 Monoc.		33	− 4	.040	.42	604	θ Urs. Maj.		28	+52	.017	.17
492	α Can. Min.	7	35	+ 5	....	.15	606	ψ Argûs	9	28	−40	.056	.51
493	24 Lyncis		36	+59	.033	.29	605	ξ Leonis		28	+12	.024	.30
495	κ Gemin.		40	+25	.018	.22	607	10 Leo. Min.		29	+37	.020	.27
496	β Gemin.		40	+28	.010	.12	620	ζ Chamæl.		36	−81	.047	.48
499	4 Puppis		42	−14	.028	.36	619	ο Leonis		37	+10	.014	.16
502	ξ Argûs	7	46	−25	.021	.27	622	θ Antliæ	9	41	−27	.057	.49
505	φ Gemin.		49	+27	.018	.28	623	ε Leonis		41	+24	.014	.17
506	26 Lyncis		49	+48	.022	.30	627	υ Argûs •		45	−65	.049	.38
507	Gr. 1374		51	+74	.029	.32	626	υ Urs. Maj.		45	+59	.013	.17
514	χ Argûs		55	−53	.052	.40	629	6 Sextantis		47	− 4	.030	.35
515	ω Cancri	7	56	+26	.022	.30	630	μ Leonis	9	48	+26	.014	.19
517	χ Gemin.	7	59	+28	.018	.24	632	Gr. 1586		51	+73	.026	.32
520	27 Lyncis	8	2	+52	.022	.23	634	19 Leo. Min.		53	+41	.022	.24
523	ρ Argûs		4	−24	.018	.24	636	φ Argûs		54	−54	.045	.37
522	3 H. Ur. Maj.		5	+69	.025	.29	638	π Leonis	9	56	+ 8	.012	.20
525	γ Argûs	8	7	−47	.051	.44	641	η Leonis	10	3	+17	.022	.22
526	ζ Cancri		8	+18	.022	.25	642	α Leonis		4	+12	.015	.13
527	Br. 1147		10	+76	.026	.31	644	λ Hydræ		7	−12	.019	.24
528	20 Puppis		10	−16	.023	.32	645	q Velorum		11	−42	.088	.76
529	β Cancri		12	+ 9	.013	.24	646	32 Urs. Maj.		12	+66	.024	.25
533	31 Lyncis	8	17	+43	.027	.22	648	ζ Leonis	10	12	+24	.018	.22
518	Gr. 1119		19	+89	.025	...	647	λ Urs. Maj.		12	+43	.017	.16
534	d^1 Cancri		19	+19	.022	.29	653	γ Leonis *pr.*		16	+20	.019	.15
535	ε Argûs	8	21	−59	.038	.33	657	μ Urs. Maj.	10	18	+42	.016	.19

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Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.	
					α	δ
		h	m	°	s	″
658	30 H. Ur. Maj.	10	18	+66	.031	.27
659	30 H. Camel.		21	+83	.026	.30
661	μ Hydræ		22	−16	.018	.22
662	31 Leo. Min.		23	+37	.019	.24
664	α Antliæ		23	−31	.044	.35
666	36 Urs. Maj.	10	26	+56	.022	.25
668	9 H. Draco.		28	+76	.019	.21
669	ρ Leonis		29	+10	.016	.21
679	33 Sextantis		37	− 1	.024	.31
683	41 Leo. Min.		39	+24	.022	.26
684	θ Argûs	10	40	−64	.052	.41
685	42 Leo. Min.		41	+31	.019	.28
687	η Argûs		42	−59	....	...
688	μ Argûs		43	−49	.049	.37
691	δ^2 Chamæl.		45	−80	.047	.39
689	l Leonis	10	45	+11	.015	.20
690	ν Hydræ		46	−16	.022	.24
692	46 Leo. Min.		49	+35	.019	.21
694	54 Leonis		51	+25	.027	.35
696	ι Antliæ		53	−37	.072	.95
695	Gr. 1706	10	54	+78	.034	.40
698	α Crateris		56	−18	.020	.25
699	d Leonis		56	+ 4	.018	.24
701	β Urs. Maj.		57	+57	.017	.16
702	α Urs. Maj.	10	59	+62	.016	.15
704	η Octantis	11	0	−84	.044	.42
703	χ Leonis		1	+ 8	.013	.19
706	p^4 Leonis		3	+ 2	.022	.25
708	ψ Urs. Maj.		5	+45	.016	.17
710	β Crateris		8	−22	.021	.33
712	δ Leonis	11	10	+21	.014	.16
713	θ Leonis		10	+16	.019	.21
718	ν Urs. Maj.		14	+34	.021	.21
719	δ Crateris		15	−14	.017	.19
720	σ Leonis		17	+ 6	.014	.19
721	π Centauri	11	17	−54	....	...
723	ι Leonis		20	+11	.018	.21
727	τ Leonis		24	+ 3	.016	.21
730	λ Draconis		27	+70	.016	.16
731	ξ Hydræ		29	−31	.050	.39
733	λ Centauri	11	32	−63	.053	.48
734	υ Leonis		33	− 0	.016	.18
735	π Chamæl.		34	−75	.079	.80
737	3 Draconis		38	+67	.025	.25
738	ζ Crateris		41	−18	.019	.29
740	χ Urs. Maj.	11	42	+48	.016	.17
744	μ Leonis		45	+15	.010	.14
745	β Virginis		47	+ 2	.012	.14
747	Gr. 1830		48	+38	.037	.32
748	γ Urs. Maj.		50	+54	.012	.14
753	π Virginis	11	57	+ 7	.016	.21
758	ο Virginis	12	1	+ 9	.016	.15
760	δ Centauri		4	−50	.067	.46
762	ε Corvi		6	−22	.020	.23
763	4 H. Draco.		8	+78	.017	.19
765	δ Crucis	12	11	−58	.058	.45
766	δ Urs. Maj.		11	+57	.020	.17
767	γ Corvi		12	−17	.019	.20
768	2 Can. Ven.	12	12	+41	.032	.32

Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Err 1920.	
					α	
		h	m	°	s	
770	β Chamæl.	12	14	−79	.037	.
772	Br. 1672		14	+88	.016	.
773	η Virginis		16	− 0	.013	.
780	α^1 Crucis		22	−63	....	.
787	20 Comæ		26	+21	.034	.
786	δ Corvi	12	26	−16	.018	.2
789	γ Crucis		27	−57	.084	.3
791	8 Can. Ven.		30	+42	.022	.2
793	κ Draconis		30	+70	.018	.1
792	β Corvi		30	−23	.019	.2
795	24 Comæ *seq.*	12	31	+19	.025	.3
796	α Muscæ		32	−69	.063	.5
799	χ Virginis		35	− 8	.024	.3
800	γ Centauri		37	−49	.041	.3
801	γ Virginis		38	− 1	.018	.2
802	ρ Virginis	12	38	+11	.023	.2
803	76 Urs. Maj.		38	+63	.034	.2
808	β Crucis		43	−59	.034	.2
810	ι Octantis		46	−85	.046	.3
812	31 Comæ		48	+28	.024	.2
814	32 H. Camel.	12	49	+84	.021	.2
813	n Centauri		49	−40	.068	.6
816	ε Urs. Maj.		51	+56	.017	.1
817	δ Virginis		52	+ 4	.013	.1
818	α Can. Ven.		52	+39	.014	.1
820	δ Muscæ	12	57	−71	.017	.3
821	ε Virginis	12	58	+11	.013	.17
827	θ Virginis	13	6	− 5	.014	.17
830	43 Comæ		8	+28	.019	.25
836	20 Can. Ven.		14	+41	.024	.24
838	γ Hydræ	13	15	−23	.022	.35
839	ι Centauri		16	−36	.056	.43
842	ζ^1 Urs. Maj.		21	+55	.020	.19
843	α Virginis		21	−11	.008	.14
846	Gr. 2001		24	+73	.026	.31
845	70 Virginis	13	25	+14	.025	.31
847	κ Octantis		28	−85	.039	.35
852	ζ Virginis		31	− 0	.010	.17
854	17 H. Can. Ven.		31	+38	.041	.42
857	ε Centauri		35	−53	.039	.34
859	m Virginis	13	37	− 8	.015	.22
863	τ Boötis		43	+18	.018	.19
866	η Urs. Maj.		44	+50	.012	.14
867	89 Virginis		46	−18	.027	.35
871	ζ Centauri		51	−47	.042	.33
872	η Boötis	13	51	+19	.012	.17
878	θ Apodis		57	−76	....	...
880	11 Boötis		58	+28	.023	.26
879	τ Virginis		58	+ 2	.013	.18
881	β Centauri	13	58	−60	....	...
882	π Hydræ	14	2	−26	.021	.
883	θ Centauri		2	−36	.044	.33
885	α Draconis		2	+65	.016	.17
888	d Boötis		7	+25	.023	.38
889	κ Virginis		9	−10	.013	.21
890	4 Urs. Min.	14	9	+78	.018	.24
891	ι Virginis		12	− 6	.017	.21
893	α Boötis		12	+20	.008	.13
894	λ Boötis	14	13	+46	.019	.21

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Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.	
				a	δ					*a*	δ
		h m	°	s	″			h m	°	s	″
892	δ Octantis	14 14	−83	.035	.30	1011	ε Cor. Bor.	15 54	+27	.023	.24
898	λ Virginis	15	−13	.017	.24	1012	δ Scorpii	15 56	−22	.020	.26
901	2 Libræ	19	−11	.025	.33	1019	θ Draconis	16 0	+59	.018	.17
904	θ Boötis	22	+52	.018	.17	1017	β Scorpii	1	−20	.014	.17
905	*f* Boötis	23	+20	.021	.26	1021	κ Herculis	4	+17	.028	.33
907	φ Virginis	14 24	− 2	.018	.25	1027	Gr. 2320	16 6	+68	.032	.35
911	5 Urs. Min.	28	+76	.019	.21	1026	φ Herculis	6	+45	.025	.22
910	ρ Boötis	28	+31	.016	.19	1023	δ^1 Apodis	8	−78	.053	.49
912	γ Boötis	29	+39	.017	.21	1030	δ Ophiuchi	10	− 3	.012	.17
914	η Centauri	30	−42	.045	.37	1031	σ Cor. Bor. *seq.*	12	+34	.037	.42
915	σ Boötis	14 31	+30	.025	.32	1034	19 Urs. Min.	16 13	+76	.029	.23
917	α^2 Centauri	34	−61	....	...	1032	γ^2 Normæ	14	−50	.049	.38
919	33 Boötis	36	+45	.034	.33	1033	ε Ophiuchi	14	− 4	.014	.22
921	α Apodis	38	−79	.044	.47	1035	σ Scorpii	16	−25	.019	.28
926	μ Virginis	39	− 5	.014	.21	1036	τ Herculis	17	+47	.022	.20
930	ε Boötis	14 41	+27	.016	.16	1039	γ Herculis	16 18	+19	.016	.21
932	109 Virginis	42	+ 2	.018	.22	1045	η Urs. Min.	20	+76	.022	.22
934	8 Libræ	46	−16	.018	.20	1041	γ Apodis	21	−79	.033	.38
936	α Libræ	46	−16	.010	.14	1046	ω Herculis	22	+14	.030	.37
941	Gr. 2164	49	+60	.033	.35	1050	η Draconis	23	+62	.018	.17
944	β Urs. Min.	14 51	+74	.016	.16	1051	α Scorpii	16 24	−26	.013	.21
945	ξ^2 Libræ	52	−11	.018	.23	1056	β Herculis	27	+22	.018	.21
946	Piazzi 221	52	+15	.025	.29	1055	λ Ophiuchi	27	+ 2	.017	.22
948	β Lupi	53	−43	.054	.45	1059	*A* Draconis	28	+69	.022	.19
950	δ Libræ	57	− 8	.026	.25	1061	τ Scorpii	31	−28	.021	.25
952	β Boötis	14 59	+41	.020	.22	1062	σ Herculis	16 32	+43	.017	.18
953	γ Scorpii	14 59	−25	.024	.29	1063	ζ Ophiuchi	33	−10	.014	.20
955	ψ Boötis	15 1	+27	.018	.22	1065	24 Scorpii	37	−18	.022	.30
962	Gr. 2283	3	+88	.023	.29	1067	ζ Herculis	38	+32	.016	.17
957	*c* Boötis	4	+25	.030	.33	1069	η Herculis	40	+39	.015	.17
959	ζ Lupi	15 7	−52	.059	.51	1068	α Tri. Aust.	16 40	−69	.036	.29
960	ι Libræ	8	−19	.021	.24	1071	Gr. 2377	44	+57	.038	.45
965	3 Serpentis	11	+ 5	.029	.31	1073	ε Scorpii	45	−34	.040	.33
963	γ Tri. Aust.	11	−68	.044	.36	1078	49 Herculis	48	+15	.024	.29
966	δ Boötis	12	+34	.018	.23	1083	ε^1 Aræ	53	−53	.056	.50
967	β Libræ	15 13	− 9	.013	.17	1084	κ Ophiuchi	16 54	+ 9	.014	.17
976	γ Urs. Min.	21	+72	.018	.16	1087	ε Urs. Min.	54	+82	.018	.16
975	μ Boötis *pr.*	21	+38	.019	.22	1086	30 Ophiuchi	57	− 4	.035	.39
977	τ^1 Serpentis	22	+16	.026	.36	1088	ε Herculis	57	+31	.016	.21
979	ι Draconis	23	+59	.025	.21	1089	*d* Herculis	16 59	+34	.026	.30
978	32 Libræ	15 24	−16	.018	.28	1092	η Ophiuchi	17 6	−16	.016	.17
980	β Cor. Bor.	25	+29	.025	.22	1093	η Scorpii	6	−43	.044	.34
973	ρ Octantis	25	−84	.037	.38	1094	ζ Draconis	9	+66	.020	.19
981	ν^1 Boötis	28	+41	.023	.31	1096	α Herculis	11	+14	.010	.14
984	γ Lupi(*mean*)	30	−41	.043	.35	1098	δ Herculis	12	+25	.020	.24
986	γ Libræ	15 31	−15	.021	.24	1100	π Herculis	17 12	+37	.018	.22
987	α Cor. Bor.	31	+27	.010	.13	1101	59 Apodis (G.)	16	−81	.073	.74
993	ζ Cor. Bor. [illegible]*q.*	36	+37	.027	.36	1105	θ Ophiuchi	17	−25	.019	.21
997	α Serpentis	40	+ 7	.010	.13	1106	*w* Herculis	18	+33	.027	.30
998	β Serpentis	42	+16	.018	.21	1107	β Aræ	19	−55	.069	.49
999	κ Serpentis	15 45	+18	.024	.25	1109	*b* Ophiuchi	17 21	−24	.018	.29
1000	μ Serpentis	45	− 3	.019	.35	1111	σ Ophiuchi	23	+ 4	.017	.22
1002	12 H. Draco.	45	+63	.028	.32	1112	δ Aræ	24	−61	....	...
1003	ε Serpentis	47	+ 5	.014	.19	1115	α Aræ	26	−50	.056	.46
1006	ζ Urs. Min.	47	+78	.016	.15	1117	λ Herculis	28	+26	.031	.37
1004	β Tri. Aust.	15 48	−63	.059	.45	1118	λ Scorpii	17 28	−37	.058	.47
1005	λ Libræ	49	−20	.026	.36	1119	β Draconis	29	+52	.014	.15
1009	γ Serpentis	53	+16	.016	.23	1123	α Ophiuchi	31	+13	.010	.14
1010	π Scorpii	15 54	−26	.023	.29	1125	ξ Serpentis	17 33	−15	.024	.24

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Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.	
				α	δ					α	δ
		h m	°	s	″			h m	°	s	″
1131	ι Herculis	17 37	+46	.018	.17	1240	δ Draconis	19 13	+68	.016	.16
1132	ω Draconis	37	+69	.021	.21	1239	*d* Sagittarii	13	−19	.014	.29
1129	η Pavonis	38	−65	.067	.58	1241	θ Lyræ	14	+38	.025	.34
1134	β Ophiuchi	40	+5	.013	.17	1242	ω Aquilæ	14	+11	.019	.21
1135	ι^1 Scorpii	42	−40	.066	.54	1243	κ Cygni	15	+53	.019	.19
1137	μ Herculis	17 43	+28	.014	.19	1248	τ Draconis	19 17	+73	.019	.20
1140	ψ Draconis	43	+72	.021	.20	1251	δ Aquilæ	21	+3	.012	.17
1138	γ Ophiuchi	44	+3	.017	.21	1259	β Cygni	27	+28	.014	.22
1146	ξ Draconis	52	+57	.021	.21	1260	ι Cygni	28	+52	.020	.19
1145	89 Herculis	52	+26	.025	.33	1264	μ Aquilæ	30	+7	.024	.28
1150	35 Draconis	17 53	+77	.022	.23	1265	*h* Sagittarii	19 32	−25	.019	.26
1147	θ Herculis	54	+37	.017	.21	1224	σ Octantis	32	−89	.025	.22
1148	ν Ophiuchi	55	−10	.016	.22	1266	κ Aquilæ	33	−7	.018	.28
1149	ξ Herculis	55	+29	.034	.30	1269	θ Cygni	34	+50	.019	.21
1151	γ Draconis	55	+51	.013	.16	1271	54 Sagittarii	36	−16	.022	.30
1152	67 Ophiuchi	17 57	+3	.031	.26	1273	β Sagittæ	19 37	+17	.016	.26
1164	δ Urs. Min.	17 58	+87	....	...	1281	15 Cygni	41	+37	.029	.29
1156	θ Aræ	18 0	−50	.056	.50	1280	*f* Sagittarii	42	−20	.020	.30
1158	γ Sagittarii	1	−30	.021	.39	1282	γ Aquilæ	42	+10	.009	.15
1159	70 Ophiuchi	1	+3	.022	.26	1283	δ Cygni	42	+45	.021	.18
1160	72 Ophiuchi	18 4	+10	.016	.19	1284	δ Sagittæ	19 44	+18	.017	.23
1161	ο Herculis	4	+29	.019	.22	1286	α Aquilæ	47	+9	.010	.14
1153	χ Octantis	8	−88	.034	.30	1288	η Aquilæ	48	+1	.022	.26
1166	μ Sagittarii	9	−21	.016	.19	1290	ε Draconis	48	+70	.024	.19
1169	η Sagittarii	12	−37	.057	.50	1289	ι Sagittarii	50	−42	.073	.62
1170	Gr. 2533	18 13	+42	.035	.40	1291	ε Pavonis	19 51	−73	....	...
1171	36 Draconis	13	+64	.020	.21	1292	β Aquilæ	51	+6	.008	.14
1173	δ Sagittarii	15	−30	.020	.25	1297	γ Sagittæ	55	+19	.017	.22
1174	η Serpentis	17	−3	.016	.17	1299	*c* Sagittarii	19 58	−28	.017	.24
1175	ε Sagittarii	19	−34	.055	.46	1304	τ Aquilæ	20 0	+7	.022	.33
1178	109 Herculis	18 20	+22	.018	.21	1308	θ Aquilæ	20 7	−1	.013	.18
1179	α Telescopii	21	−46	.049	.41	1314	ο Cygni *seq.*	11	+46	.019	.21
1185	χ Draconis	23	+73	.020	.20	1318	κ Cephei	12	+77	.018	.19
1182	λ Sagittarii	23	−25	.017	.22	1319	24 Vulpeculæ	13	+24	.025	.30
1187	*c* Serpentis	26	−2	.027	.38	1320	α^2 Capricorni	14	−13	.012	.17
1189	1 Aquilæ	18 31	−8	.013	.25	1321	β Capricorni	20 17	−15	.022	.21
1190	ζ Pavonis	34	−71	.016	.40	1324	α Pavonis	19	−57	....	...
1193	α Lyræ	34	+39	.009	.15	1325	γ Cygni	19	+40	.013	.17
1196	2 Aquilæ	38	−9	.029	.30	1328	π Capricorni	23	−18	.019	.27
1199	φ Sagittarii	41	−27	.022	.26	1329	ρ Capricorni	24	−18	.018	.21
1202	110 Herculis	18 42	+20	.020	.22	1332	41 Cygni	20 26	+30	.029	.35
1204	6 Aquilæ	43	−5	.020	.32	1336	θ Cephei	28	+63	.018	.17
1206	λ Pavonis	45	−62	.059	.52	1337	ε Delphini	29	+11	.013	.19
1209	β Lyræ	47	+33	.013	.16	1340	Gr. 3241	30	+72	.034	.40
1212	50 Draconis	49	+75	.031	.25	1341	α Indi	32	−48	.046	.37
1213	ο Draconis	18 50	+59	.028	.21	1344	β Delphini	20 34	+14	.016	.22
1211	σ Sagittarii	50	−26	.018	.27	1348	υ Capricorni	35	−18	.023	.33
1215	θ Serp. *pr.*	52	+4	.017	.25	1349	α Delphini	36	+16	.014	.22
1218	R Lyræ	53	+44	.025	.31	1350	β Pavonis	38	−66	....	...
1220	γ Lyræ	56	+33	.018	.22	1352	α Cygni	39	+45	.010	.12
1219	ε Aquilæ	18 56	+15	.017	.19	1353	δ Delphini	20 40	+15	.019	.24
1222	ζ Sagittarii	58	−30	.042	.37	1354	ψ Capricorni	41	−26	.028	.32
1255	λ Urs. Min.	18 59	+89	....	...	1356	γ Delph. *seq.*	43	+16	.024	.30
1226	ζ Aquilæ	19 2	+14	.014	.15	1357	ε Cygni	43	+34	.014	.21
1227	λ Aquilæ	2	−5	.014	.23	1358	ε Aquarii	43	−10	.014	.19
1228	α Cor. Aust.	19 4	−38	.050	.42	1361	η Cephei	20 44	+62	.018	.16
1230	ι Lyræ	4	+36	.025	.29	1366	μ Aquarii	48	−9	.016	.22
1231	π Sagittarii	5	−21	.019	.23	1368	76 Draconis	48	+82	.022	.21
1237	ψ Sagittarii	19 11	−25	.021	.31	1364	β Indi	20 49	−59	.067	.58

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Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.	
				α	δ					α	δ
		h m	°	s	″			h m	°	s	″
1369	32 Vulpeculæ	20 51	+28	.018	.22	1495	10 Lacertæ	22 36	+39	.027	.30
1371	220 Draco.(H^1.)	51	+80	.021	.25	1497	ε Pisc. Aust.	36	−27	.028	.38
1373	ν Cygni	54	+41	.022	.22	1499	ζ Pegasi	37	+10	.013	.17
1372	α Octantis	55	−77	.055	.46	1500	β Gruis	38	−47	.060	.46
1374	γ Microscop.	20 56	−33	.037	.49	1498	β Octantis	38	−82	.036	.30
1378	θ Capricorni	21 1	−18	.017	.22	1501	η Pegasi	22 39	+30	.017	.21
1380	ξ Cygni	2	+44	.018	.20	1504	λ Pegasi	43	+23	.016	.21
1381	61 Cygni *pr*.	3	+38	.020	.19	1505	ε Gruis	44	−52	.052	.48
1384	ν Aquarii	5	−12	.019	.28	1506	τ Aquarii	45	−14	.018	.24
1387	Br. 2777	7	+78	.023	.21	1507	μ Pegasi	46	+24	.016	.19
1386	3 Pisc. Aust.	21 9	−28	.032	.46	1510	ι Cephei	22 47	+66	.014	.17
1389	ζ Cygni	10	+30	.015	.18	1512	λ Aquarii	48	− 8	.013	.19
1391	τ Cygni	12	+38	.022	.22	1513	ρ Indi	49	−71	.051	.62
1392	α Equulei	12	+ 5	.015	.20	1514	δ Aquarii	50	−16	.019	.25
1394	σ Cygni	14	+39	.021	.28	1516	α Pisc. Aust.	53	−30	.032	.28
1396	θ^1 Microscop.	21 16	−41	.074	.80	1520	ο Androm.	22 58	+42	.017	.22
1397	α Cephei	17	+62	.016	.14	1523	β Pegasi	23 0	+28	.020	.21
1398	ι Capricorni	18	−17	.021	.25	1525	α Pegasi	1	+15	.010	.14
1399	1 Pegasi	18	+19	.020	.27	1528	55 Pegasi	3	+ 9	.029	.40
1400	γ Pavonis	20	−66	.061	.43	1531	c^2 Aquarii	5	−22	.023	.32
1403	ζ Capricorni	21 22	−23	.024	.31	1533	π Cephei	23 5	+75	.019	.21
1406	*g* Cygni	27	+46	.028	.29	1532	ι Gruis	6	−46	.064	.56
1407	β Aquarii	27	− 6	.018	.18	1534	59 Pegasi	8	+ 8	.028	.41
1409	β Cephei	28	+70	.014	14	1535	5 Cassiop.(H^1.)	9	+57	.030	.31
1415	ξ Aquarii	33	− 8	.016	.22	1536	φ Aquarii	10	− 6	.016	.22
1416	74 Cygni	21 34	+40	.029	.31	1537	ψ Aquarii	23 12	−10	.020	.29
1417	γ Capricorni	36	−17	.018	.26	1539	γ Tucanæ	13	−59	.044	.38
1418	λ Octantis	39	−83	.065	.51	1540	γ Piscium	13	+ 3	.013	.16
1424	ε Pegasi	40	+10	.012	.18	1542	γ Sculptoris	15	−33	.053	.46
1426	11 Cephei	41	+71	.028	.26	1544	ο Cephei	15	+68	.025	.25
1428	δ Capricorni	21 43	−16	.017	.21	1546	τ Pegasi	23 17	+23	.020	.25
1431	π^2 Cygni	44	+49	.022	.24	1548	b^1 Aquarii	19	−21	.024	.32
1433	μ Capricorni	49	−14	.016	.23	1550	4 Cassiop.	21	+62	.022	.23
1434	γ Gruis	49	−38	.064	.52	1549	υ Pegasi	21	+23	.020	.24
1435	16 Pegasi	49	+26	.018	.22	1552	κ Piscium	23	+ 1	.014	.19
1439	79 Draconis	21 52	+73	.023	.25	1553	θ Piscium	23 24	+ 6	.019	.26
1444	20 Pegasi	57	+13	.022	.25	1555	70 Pegasi	25	+12	.022	.26
1442	ε Indi	21 57	−57	.058	.80	1559	39 H. Cephei	28	+87	.018	.21
1449	α Aquarii	22 2	− 1	.010	.13	1558	β Sculptoris	29	−38	.046	.47
1450	ι Aquarii	2	−14	.020	.22	1561	72 Pegasi	30	+31	.026	.30
1452	20 Cephei	22 3	+62	.029	.29	1567	λ Androm.	23 34	+46	.016	.20
1451	α Gruis	3	−47	....	...	1568	ι Androm.	34	+43	.021	.21
1453	ι Pegasi	3	+25	.019	.21	1569	ι Piscium	36	+ 5	.013	.19
1456	θ Pegasi	6	+ 6	.017	.22	1570	γ Cephei	36	+77	.014	.14
1457	π Pegasi	6	+33	.022	.25	1572	κ Androm.	36	+44	.020	.23
1459	ζ Cephei	22 8	+58	.018	.18	1574	ω^2 Aquarii	23 39	−15	.023	.37
1460	24 Cephei	8	+72	.021	.22	1576	i^1 Aquarii	40	−19	.022	.27
1466	θ Aquarii	13	− 8	.013	.21	1577	ψ Androm.	42	+46	.023	.39
1467	α Tucanæ	13	−61	.041	.32	1580	41 H. Cephei	44	+67	.024	.27
1469	υ Octantis	17	−86	.026	.22	1581	δ Sculptoris	45	−29	.024	.33
1473	γ Aquarii	22 18	− 2	.013	.18	1582	γ^1 Octantis	23 47	−82	.032	.29
1474	31 Pegasi	18	+12	.024	.28	1583	φ Pegasi	48	+19	.023	.31
1477	3 Lacertæ	20	+52	.018	.20	1586	ρ Cassiop.	50	+57	.032	.28
1478	π Aquarii	21	+ 1	.018	.30	1587	Gr. 4163	51	+74	.032	.37
1483	σ Aquarii	26	−11	.016	.21	1592	ω Piscium	55	+ 6	.013	.16
1488	α Lacertæ	22 28	+50	.020	.19	1593	ε Tucanæ	23 56	−66	.071	.60
1489	υ Aquarii	30	−21	.026	.33	1595	30 Piscium	58	− 6	.022	.28
1491	226 B. Cephei	31	+76	.026	.25	1596	2 Ceti	23 59	−18	.018	.23
1490	η Aquarii	22 31	− 1	.013	.19						

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 45 34.17	34.81	−23 2 21.8	21.0	11.046	+12.02	+ 3 33.42	16 17.86	1 11.06	18 42 0.82
2	18 49 59.08	59.80	22 57 19.4	18.4	11.031	13.17	4 1.78	16 17.86	1 11.02	18 45 57.38
3	18 54 23.63	24.44	22 51 49.5	48.4	11.015	14.31	4 29.78	16 17.87	1 10.97	18 49 53.94
4	18 58 47.79	48.69	22 45 52.3	51.1	10.998	15.44	4 57.39	16 17.87	1 10.92	18 53 50.50
5	19 3 11.53	12.51	22 39 28.1	26.7	10.980	16.57	5 24.57	16 17.86	1 10.86	18 57 47.06
6	19 7 34.82	35.89	−22 32 37.1	35.4	10.961	+17.68	+ 5 51.31	16 17.85	1 10.80	19 1 43.62
7	19 11 57.63	58.78	22 25 19.4	17.4	10.940	18.78	6 17.57	16 17.83	1 10.74	19 5 40.18
8	19 16 19.94	21.16	22 17 35.2	33.0	10.918	19.88	6 43.32	16 17.81	1 10.67	19 9 36.74
9	19 20 41.72	43.01	22 9 24.8	22.4	10.896	20.97	7 8.53	16 17.78	1 10.60	19 13 33.30
10	19 25 2.94	4.30	22 0 48.5	45.9	10.873	22.05	7 33.20	16 17.74	1 10.52	19 17 29.85
11	19 29 23.59	25.02	−21 51 46.4	43.5	10.849	+23.12	+ 7 57.30	16 17.70	1 10.44	19 21 26.41
12	19 33 43.66	45.16	21 42 18.9	15.7	10.823	24.17	8 20.81	16 17.66	1 10.36	19 25 22.97
13	19 38 3.12	4.69	21 32 26.2	22.7	10.797	25.21	8 43.72	16 17.60	1 10.28	19 29 19.53
14	19 42 21.96	23.59	21 22 8.5	4.7	10.771	26.25	9 6.01	16 17.54	1 10.19	19 33 16.09
15	19 46 40.17	41.85	21 11 26.1	21.9	10.744	27.27	9 27.67	16 17.47	1 10.10	19 37 12.64
16	19 50 57.72	59.47	−21 0 19.4	14.8	10.717	+28.28	+ 9 48.66	16 17.39	1 10.01	19 41 9.20
17	19 55 14.60	16.42	20 48 48.5	43.5	10.689	29.28	10 8.98	16 17.31	1 9.91	19 45 5.76
18	19 59 30.80	32.67	20 36 53.8	48.5	10.661	30.27	10 28.62	16 17.23	1 9.81	19 49 2.32
19	20 3 46.29	48.21	20 24 35.7	30.1	10.632	31.23	10 47.56	16 17.14	1 9.71	19 52 58.88
20	20 8 1.08	3.04	20 11 54.4	48.4	10.601	32.19	11 5.79	16 17.05	1 9.61	19 56 55.44
21	20 12 15.14	17.14	−19 58 50.1	43.8	10.570	+33.14	+11 23.28	16 16.95	1 9.51	20 0 51.99
22	20 16 28.46	30.50	19 45 23.5	16.9	10.539	34.06	11 40.03	16 16.85	1 9.40	20 4 48.55
23	20 20 41.02	43.10	19 31 34.9	28.0	10.507	34.97	11 56.02	16 16.74	1 9.29	20 8 45.11
24	20 24 52.80	54.92	19 17 24.3	17.1	10.475	35.88	12 11.25	16 16.63	1 9.18	20 12 41.67
25	20 29 3.80	5.95	19 2 52.4	44.9	10.442	36.77	12 25.69	16 16.51	1 9.07	20 16 38.22
26	20 33 14.00	16.19	−18 47 59.7	51.8	10.408	+37.63	+12 39.33	16 16.39	1 8.96	20 20 34.78
27	20 37 23.39	25.62	18 32 46.3	38.1	10.375	38.48	12 52.16	16 16.27	1 8.85	20 24 31.34
28	20 41 31.97	34.23	18 17 12.8	4.3	10.341	39.30	13 4.18	16 16.15	1 8.74	20 28 27.90
29	20 45 39.73	42.01	18 1 19.6	10.8	10.307	40.12	13 15.37	16 16.03	1 8.62	20 32 24.45
30	20 49 46.66	48.96	17 44 67.0	57.9	10.272	40.91	13 25.73	16 15.90	1 8.51	20 36 21.01
31	20 53 52.75	55.07	−17 28 35.6	26.2	10.237	+41.69	+13 35.26	16 15.77	1 8.39	20 40 17.57
Feb. 1	20 57 58.00	60.34	17 11 45.7	36.0	10.202	42.46	13 43.95	16 15.63	1 8.28	20 44 14.12
2	21 2 2.41	4.76	16 54 37.6	27.7	10.167	43.21	13 51.79	16 15.49	1 8.17	20 48 10.68
3	21 6 5.99	8.34	16 37 11.9	1.7	10.132	43.93	13 58.80	16 15.34	1 8.06	20 52 7.24
4	21 10 8.73	11.09	16 19 29.0	18.5	10.097	44.64	14 4.98	16 15.19	1 7.94	20 56 3.79
5	21 14 10.64	13.01	−16 1 29.2	18.5	10.063	+45.33	+14 10.33	16 15.04	1 7.83	21 0 0.35
6	21 18 11.72	14.10	15 43 13.0	2.1	10.028	46.01	14 14.85	16 14.88	1 7.71	21 3 56.91
7	21 22 11.98	14.36	15 24 40.8	29.7	9.994	46.67	14 18.54	16 14.71	1 7.59	21 7 53.46
8	21 26 11.43	13.80	15 5 53.0	41.7	9.960	47.31	14 21.42	16 14.54	1 7.47	21 11 50.02
9	21 30 10.07	12.44	14 46 50.0	38.6	9.927	47.93	14 23.50	16 14.37	1 7.36	21 15 46.57
10	21 34 7.91	10.28	−14 27 32.2	20.7	9.894	+48.54	+14 24.78	16 14.19	1 7.25	21 19 43.13
11	21 38 4.97	7.33	14 7 60.0	48.4	9.862	49.14	14 25.28	16 14.00	1 7.14	21 23 39.69
12	21 42 1.26	3.62	13 48 13.7	2.0	9.830	49.71	14 25.02	16 13.81	1 7.03	21 27 36.24
13	21 45 56.80	59.16	13 28 13.8	1.9	9.799	50.27	14 24.00	16 13.62	1 6.93	21 31 32.80
14	21 49 51.61	53.95	13 7 60.7	48.6	9.769	50.81	14 22.24	16 13.42	1 6.82	21 35 29.35
15	21 53 45.70	48.02	−12 47 34.7	22.5	9.739	+51.34	+14 19.76	16 13.22	1 6.72	21 39 25.91
16	21 57 39.07	41.38	−12 26 56.2	43.9	9.710	+51.86	+14 16.57	16 13.02	1 6.61	21 43 22.46

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Feb. 16	21 57 39.07	41.38	−12 26 56.2	43.9	9.710	+51.86	+14 16.57	16 13.02	1 6.61	21 43 22.46
17	22 1 31.74	34.04	12 5 65.6	53.2	9.681	52.35	14 12.68	16 12.81	1 6.51	21 47 19.02
18	22 5 23.72	26.00	11 44 63.3	50.9	9.652	52.83	14 8.10	16 12.59	1 6.41	21 51 15.57
19	22 9 15.03	17.29	11 23 49.7	37.3	9.624	53.29	14 2.85	16 12.37	1 6.31	21 55 12.13
20	22 13 5.68	7.91	11 2 25.3	12.8	9.597	53.73	13 56.94	16 12.15	1 6.21	21 59 8.68
21	22 16 55.68	57.88	−10 40 50.5	38.0	9.570	+54.16	+13 50.37	16 11.93	1 6.11	22 3 5.24
22	22 20 45.03	47.21	10 18 65.8	53.3	9.544	54.56	13 43.16	16 11.71	1 6.02	22 7 1.79
23	22 24 33.76	35.92	9 56 71.5	59.1	9.518	54.95	13 35.33	16 11.48	1 5.93	22 10 58.35
24	22 28 21.88	24.01	9 34 68.0	55.6	9.493	55.33	13 26.89	16 11.25	1 5.84	22 14 54.90
25	22 32 9.39	11.49	9 12 55.9	43.5	9.468	55.68	13 17.85	16 11.02	1 5.75	22 18 51.46
26	22 35 56.31	58.38	− 8 50 35.6	23.3	9.444	+56.01	+13 8.22	16 10.79	1 5.67	22 22 48.01
27	22 39 42.66	44.70	8 27 67.5	55.3	9.420	56.33	12 58.01	16 10.55	1 5.59	22 26 44.57
28	22 43 28.45	30.46	8 5 31.9	19.8	9.397	56.63	12 47.24	16 10.32	1 5.51	22 30 41.12
Mar. 1	22 47 13.70	15.67	7 42 49.3	37.3	9.375	56.91	12 35.93	16 10.08	1 5.44	22 34 37.68
2	22 50 58.42	60.35	7 19 60.2	48.4	9.353	57.17	12 24.09	16 9.84	1 5.37	22 38 34.23
3	22 54 42.63	44.52	− 6 56 65.0	53.3	9.332	+57.42	+12 11.74	16 9.60	1 5.30	22 42 30.78
4	22 58 26.34	28.20	6 33 63.9	52.4	9.312	57.65	11 58.89	16 9.36	1 5.23	22 46 27.34
5	23 2 9.57	11.39	6 10 57.5	46.2	9.292	57.86	11 45.57	16 9.12	1 5.16	22 50 23.89
6	23 5 52.35	54.13	5 47 46.1	34.9	9.273	58.06	11 31.79	16 8.88	1 5.10	22 54 20.44
7	23 9 34.69	36.43	5 24 30.2	19.2	9.255	58.24	11 17.58	16 8.63	1 5.04	22 58 17.00
8	23 13 16.61	18.31	− 5 0 70.1	59.3	9.239	+58.41	+11 2.94	16 8.38	1 4.98	23 2 13.55
9	23 16 58.14	59.80	4 37 46.2	35.6	9.223	58.57	10 47.91	16 8.12	1 4.92	23 6 10.11
10	23 20 39.29	40.92	4 14 18.9	8.5	9.208	58.71	10 32.52	16 7.86	1 4.87	23 10 6.66
11	23 24 20.10	21.69	3 50 48.5	38.3	9.193	58.82	10 16.78	16 7.60	1 4.82	23 14 3.22
12	23 28 0.58	2.12	3 27 15.2	5.3	9.180	58.93	10 0.71	16 7.34	1 4.77	23 17 59.77
13	23 31 40.76	42.26	− 3 3 39.4	29.8	9.169	+59.03	+ 9 44.34	16 7.07	1 4.72	23 21 56.32
14	23 35 20.67	22.12	2 39 61.6	52.3	9.158	59.11	9 27.69	16 6.80	1 4.68	23 25 52.88
15	23 39 0.32	1.73	2 16 22.0	13.0	9.148	59.18	9 10.78	16 6.53	1 4.64	23 29 49.43
16	23 42 39.75	41.11	1 52 41.0	32.3	9.139	59.23	8 53.66	16 6.26	1 4.61	23 33 45.98
17	23 46 18.97	20.29	1 28 58.9	50.4	9.131	59.27	8 36.34	16 5.99	1 4.58	23 37 42.54
18	23 49 58.01	59.29	− 1 5 16.1	7.9	9.123	+59.29	+ 8 18.83	16 5.72	1 4.55	23 41 39.09
19	23 53 36.89	38.12	0 41 33.0	25.1	9.117	59.30	8 1.14	16 5.44	1 4.53	23 45 35.64
20	23 57 15.62	16.80	− 0 17 50.0	42.3	9.112	59.29	7 43.32	16 5.16	1 4.51	23 49 32.20
21	0 0 54.22	55.35	+ 0 5 52.7	60.1	9.107	59.26	7 25.39	16 4.88	1 4.49	23 53 28.75
22	0 4 32.73	33.81	0 29 34.5	41.6	9.103	59.22	7 7.35	16 4.60	1 4.47	23 57 25.30
23	0 8 11.15	12.19	+ 0 53 15.2	22.0	9.099	+59.17	+ 6 49.21	16 4.32	1 4.46	0 1 21.86
24	0 11 49.50	50.49	1 16 54.4	60.8	9.097	59.09	6 31.00	16 4.04	1 4.45	0 5 18.41
25	0 15 27.80	28.74	1 40 31.7	37.7	9.095	59.00	6 12.75	16 3.76	1 4.44	0 9 14.97
26	0 19 6.06	6.95	2 4 6.6	12.3	9.094	58.90	5 54.47	16 3.48	1 4.44	0 13 11.52
27	0 22 44.31	45.15	2 27 38.9	44.3	9.094	58.78	5 36.16	16 3.21	1 4.44	0 17 8.07
28	0 26 22.55	23.35	+ 2 51 8.0	13.1	9.094	+58.65	+ 5 17.85	16 2.93	1 4.44	0 21 4.63
29	0 30 0.82	1.57	3 14 33.7	38.5	9.095	58.49	4 59.57	16 2.66	1 4.44	0 25 1.18
30	0 33 39.12	39.82	3 37 55.5	60.0	9.097	58.32	4 41.32	16 2.38	1 4.45	0 28 57.74
31	0 37 17.46	18.12	4 1 13.2	17.4	9.100	58.14	4 23.12	16 2.11	1 4.46	0 32 54.29
Apr. 1	0 40 55.88	56.49	4 24 26.4	30.3	9.103	57.95	4 4.98	16 1.83	1 4.47	0 36 50.84
2	0 44 34.38	34.95	+ 4 47 34.6	38.3	9.107	+57.74	+ 3 46.94	16 1.56	1 4.49	0 40 47.40
3	0 48 12.98	13.51	+ 5 10 37.6	41.0	9.111	+57.51	+ 3 29.00	16 1.29	1 4.51	0 44 43.95

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon
	Mean Noon.	App. Noon	Mean Noon	App Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 40 55.88	56.49	+ 4 24 26.4	30.3	9.103	+57.95	+4 4.98	16 1.83	1 4.47	0 36 50.8
2	0 44 34.38	34.95	4 47 34.6	38.3	9.107	57.74	3 46.94	16 1.56	1 4.49	0 40 47.4
3	0 48 12.98	13.51	5 10 37.6	41.0	9.111	57.51	3 29.00	16 1.29	1 4.51	0 44 43.9
4	0 51 51.71	52.20	5 33 35.0	38.0	9.116	57.27	3 11.18	16 1.02	1 4.53	0 48 40.5
5	0 55 30.58	31.03	5 56 26.4	29.1	9.122	57.01	2 53.50	16 0.75	1 4.56	0 52 37.0
6	0 59 9.61	10.01	+ 6 19 11.4	13.8	9.130	+56.74	+2 35.98	16 0.48	1 4.59	0 56 33.6
7	1 2 48.82	49.17	6 41 49.8	51.9	9.138	56.46	2 18.64	16 0.21	1 4.62	1 0 30.1
8	1 6 28.23	28.53	7 4 21.3	23.2	9.147	56.16	2 1.50	15 59.94	1 4.65	1 4 26.7
9	1 10 7.86	8.12	7 26 45.6	47.3	9.156	55.85	1 44.58	15 59.67	1 4.69	1 8 23.2
10	1 13 47.73	47.94	7 49 2.3	3.7	9.167	55.53	1 27.90	15 59.40	1 4.73	1 12 19.8
11	1 17 27.87	28.03	+ 8 11 11.2	12.3	9.179	+55.20	+1 11.49	15 59.13	1 4.77	1 16 16.3
12	1 21 8.30	8.42	8 33 12.0	12.8	9.191	54.86	0 55.36	15 58.85	1 4.81	1 20 12.9
13	1 24 49.04	49.13	8 55 4.2	4.8	9.204	54.50	0 39.54	15 58.58	1 4.85	1 24 9.4
14	1 28 30.10	30.17	9 16 47.7	48.0	9.218	54.13	0 24.06	15 58.31	1 4.90	1 28 6.0
15	1 32 11.52	11.55	9 38 22.1	22.2	9.233	53.74	+0 8.92	15 58.03	1 4.95	1 32 2.6
16	1 35 53.30	53.29	+ 9 59 47.0	47.0	9.249	+53.33	−0 5.86	15 57.76	1 5.00	1 35 59.1
17	1 39 35.45	35.41	10 21 2.2	1.9	9.265	52.92	0 20.26	15 57.48	1 5.05	1 39 55.7
18	1 43 17.99	17.92	10 42 7.3	6.8	9.282	52.50	0 34.26	15 57.21	1 5.11	1 43 52.2
19	1 47 0.95	0.84	11 3 2.0	1.2	9.299	52.05	0 47.85	15 56.94	1 5.17	1 47 48.8
20	1 50 44.33	44.18	11 23 45.8	44.8	9.317	51.59	1 1.02	15 56.67	1 5.23	1 51 45.37
21	1 54 28.15	27.96	+11 44 18.4	17.3	9.335	+51.12	−1 13.77	15 56.41	1 5.29	1 55 41.93
22	1 58 12.40	12.18	12 4 39.5	38.3	9.353	50.63	1 26.07	15 56.15	1 5.35	1 59 38.48
23	2 1 57.11	56.86	12 24 48.8	47.4	9.372	50.13	1 37.92	15 55.89	1 5.41	2 3 35.04
24	2 5 42.28	42.00	12 44 45.8	44.3	9.392	49.61	1 49.30	15 55.64	1 5.48	2 7 31.59
25	2 9 27.93	27.61	13 4 30.3	28.7	9.412	49.08	2 0.21	15 55.39	1 5.55	2 11 28.15
26	2 13 14.06	13.71	+13 24 1.9	0.1	9.432	+48.54	−2 10.65	15 55.14	1 5.62	2 15 24.70
27	2 17 0.67	0.30	13 43 20.2	18.3	9.452	47.98	2 20.59	15 54.89	1 5.69	2 19 21.26
28	2 20 47.78	47.38	14 2 25.0	23.0	9.473	47.41	2 30.03	15 54.65	1 5.77	2 23 17.82
29	2 24 35.39	34.96	14 21 15.9	13.8	9.494	46.82	2 38.97	15 54.41	1 5.84	2 27 14.37
30	2 28 23.50	23.05	14 39 52.3	50.3	9.515	46.22	2 47.41	15 54.17	1 5.92	2 31 10.93
May 1	2 32 12.12	11.66	+14 58 14.3	12.2	9.537	+45.61	−2 55.34	15 53.93	1 6.01	2 35 7.48
2	2 36 1.26	0.78	15 16 21.3	19.1	9.559	44.98	3 2.75	15 53.70	1 6.09	2 39 4.04
3	2 39 50.94	50.43	15 34 13.1	10.8	9.581	44.33	3 9.64	15 53.47	1 6.17	2 43 0.60
4	2 43 41.13	40.61	15 51 49.4	47.1	9.603	43.68	3 16.00	15 53.25	1 6.25	2 46 57.15
5	2 47 31.85	31.32	16 9 9.8	7.4	9.625	43.02	3 21.83	15 53.03	1 6.33	2 50 53.71
6	2 51 23.12	22.57	+16 26 14.1	11.7	9.648	+42.34	−3 27.12	15 52.81	1 6.41	2 54 50.26
7	2 55 14.95	14.38	16 42 62.0	59.6	9.671	41.65	3 31.86	15 52.59	1 6.49	2 58 46.82
8	2 59 7.33	6.75	16 59 33.2	30.8	9.694	40.95	3 36.04	15 52.37	1 6.57	3 2 43.38
9	3 2 60.27	59.68	17 15 47.5	45.0	9.718	40.24	3 39.66	15 52.15	1 6.65	3 6 39.93
10	3 6 53.78	53.18	17 31 44.5	42.0	9.742	39.51	3 42.71	15 51.93	1 6.74	3 10 36.49
11	3 10 47.86	47.25	+17 47 24.0	21.6	9.766	+38.77	−3 45.19	15 51.72	1 6.82	3 14 33.04
12	3 14 42.53	41.91	18 2 45.7	43.3	9.790	38.02	3 47.08	15 51.51	1 6.90	3 18 29.60
13	3 18 37.79	37.16	18 17 49.3	46.9	9.814	37.27	3 48.37	15 51.30	1 6.98	3 22 26.16
14	3 22 33.63	33.00	18 32 34.6	32.3	9.839	36.51	3 49.08	15 51.09	1 7.06	3 26 22.72
15	3 26 30.07	29.44	18 46 61.4	59.1	9.864	35.73	3 49.20	15 50.88	1 7.14	3 30 19.27
16	3 30 27.09	26.46	+19 1 9.2	7.0	9.888	+34.94	−3 48.73	15 50.68	1 7.22	3 34 15.83
17	3 34 24.71	24.08	+19 14 57.8	55.7	9.912	+34.12	−3 47.68	15 50.48	1 7.30	3 38 12.39

Note.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 34 24.71	24.08	+19 14 57.8	55.7	9.912	+34.12	−3 47.68	15 50.48	1 7.30	3 38 12.39
18	3 38 22.90	22.28	19 28 26.9	24.8	9.936	33.30	3 46.05	15 50.28	1 7.38	3 42 8.94
19	3 42 21.66	21.05	19 41 36.2	34.2	9.960	32.47	3 43.84	15 50.09	1 7.46	3 46 5.50
20	3 46 21.00	20.40	19 54 25.5	23.5	9.984	31.63	3 41.06	15 49.90	1 7.54	3 50 2.06
21	3 50 20.90	20.30	20 6 54.5	52.6	10.007	30.78	3 37.72	15 49.71	1 7.61	3 53 58.62
22	3 54 21.35	20.75	+20 19 2.9	1.1	10.030	+29.91	−3 33.83	15 49.53	1 7.69	3 57 55.17
23	3 58 22.33	21.74	20 30 50.5	48.8	10.052	29.04	3 29.40	15 49.35	1 7.76	4 1 51.73
24	4 2 23.84	23.26	20 42 17.0	15.4	10.074	28.16	3 24.45	15 49.18	1 7.83	4 5 48.29
25	4 6 25.87	25.31	20 53 22.1	20.6	10.095	27.27	3 18.98	15 49.02	1 7.90	4 9 44.84
26	4 10 28.41	27.86	21 4 5.6	4.2	10.115	26.36	3 13.00	15 48.86	1 7.97	4 13 41.40
27	4 14 31.43	30.90	+21 14 27.3	26.0	10.135	+25.44	−3 6.54	15 48.70	1 8.04	4 17 37.96
28	4 18 34.91	34.40	21 24 27.0	25.8	10.154	24.52	2 59.62	15 48.54	1 8.11	4 21 34.52
29	4 22 38.85	38.36	21 34 4.4	3.3	10.173	23.59	2 52.25	15 48.39	1 8.17	4 25 31.08
30	4 26 43.23	42.76	21 43 19.3	18.2	10.191	22.65	2 44.43	15 48.25	1 8.23	4 29 27.64
31	4 30 48.02	47.57	21 52 11.5	10.5	10.208	21.71	2 36.19	15 48.11	1 8.29	4 33 24.19
June 1	4 34 53.21	52.79	+22 0 40.9	40.0	10.224	+20.75	−2 27.56	15 47.98	1 8.35	4 37 20.75
2	4 38 58.79	58.40	22 8 47.4	46.6	10.240	19.78	2 18.54	15 47.85	1 8.41	4 41 17.31
3	4 43 4.74	4.38	22 16 30.6	29.9	10.255	18.81	2 9.14	15 47.72	1 8.47	4 45 13.87
4	4 47 11.05	10.71	22 23 50.5	49.9	10.270	17.84	1 59.40	15 47.59	1 8.52	4 49 10.43
5	4 51 17.69	17.37	22 30 47.0	46.5	10.284	16.86	1 49.32	15 47.47	1 8.57	4 53 6.98
6	4 55 24.65	24.36	+22 37 19.9	19.5	10.297	+15.88	−1 38.91	15 47.36	1 8.62	4 57 3.54
7	4 59 31.92	31.66	22 43 29.0	28.7	10.309	14.89	1 28.19	15 47.25	1 8.66	5 1 0.10
8	5 3 39.49	39.26	22 49 14.3	14.0	10.321	13.89	1 17.18	15 47.14	1 8.70	5 4 56.66
9	5 7 47.34	47.14	22 54 35.6	35.3	10.332	12.89	1 5.88	15 47.03	1 8.74	5 8 53.22
10	5 11 55.46	55.30	22 59 32.8	32.6	10.343	11.88	0 54.32	15 46.92	1 8.77	5 12 49.78
11	5 16 3.83	3.70	+23 4 5.8	5.7	10.353	+10.87	−0 42.51	15 46.81	1 8.80	5 16 46.33
12	5 20 12.43	12.33	23 8 14.5	14.5	10.362	9.85	0 30.47	15 46.71	1 8.83	5 20 42.89
13	5 24 21.24	21.18	23 11 58.8	58.8	10.370	8.83	0 18.21	15 46.61	1 8.85	5 24 39.45
14	5 28 30.24	30.22	23 15 18.7	18.7	10.378	7.81	−0 5.77	15 46.52	1 8.87	5 28 36.01
15	5 32 39.41	39.43	23 18 14.0	14.0	10.385	6.79	+0 6.84	15 46.43	1 8.89	5 32 32.57
16	5 36 48.73	48.78	+23 20 44.6	44.6	10.390	+ 5.76	+0 19.60	15 46.35	1 8.91	5 36 29.13
17	5 40 58.17	58.25	23 22 50.5	50.5	10.395	4.73	0 32.48	15 46.27	1 8.93	5 40 25.68
18	5 45 7.70	7.82	23 24 31.6	31.6	10.399	3.70	0 45.46	15 46.20	1 8.94	5 44 22.24
19	5 49 17.31	17.48	23 25 48.0	48.0	10.401	2.67	0 58.51	15 46.13	1 8.95	5 48 18.80
20	5 53 26.96	27.17	23 26 39.5	39.5	10.402	1.63	1 11.60	15 46.06	1 8.95	5 52 15.36
21	5 57 36.63	36.88	+23 27 6.1	6.1	10.403	+ 0.60	+1 24.71	15 46.00	1 8.95	5 56 11.92
22	6 1 46.30	46.59	23 27 7.9	7.9	10.402	− 0.44	1 37.83	15 45.94	1 8.94	6 0 8.48
23	6 5 55.94	56.26	23 26 44.9	44.9	10.400	1.48	1 50.92	15 45.89	1 8.93	6 4 5.04
24	6 10 5.52	5.87	23 25 57.1	57.0	10.397	2.51	2 3.94	15 45.85	1 8.92	6 8 1.60
25	6 14 15.01	15.41	23 24 44.5	44.3	10.393	3.54	2 16.86	15 45.81	1 8.91	6 11 58.15
26	6 18 24.37	24.80	+23 23 7.1	6.8	10.387	− 4.57	+2 29.67	15 45.78	1 8.89	6 15 54.71
27	6 22 33.58	34.05	23 21 4.9	4.6	10.381	5.60	2 42.33	15 45.76	1 8.87	6 19 51.27
28	6 26 42.62	43.13	23 18 38.1	37.8	10.373	6.63	2 54.82	15 45.74	1 8.84	6 23 47.83
29	6 30 51.47	52.01	23 15 46.9	46.5	10.364	7.65	3 7.11	15 45.72	1 8.81	6 27 44.39
30	6 35 0.10	0.68	23 12 31.2	30.7	10.354	8.67	3 19.18	15 45.71	1 8.78	6 31 40.95
July 1	6 39 8.48	9.09	+23 8 51.1	50.6	10.344	− 9.68	+3 31.01	15 45.70	1 8.75	6 35 37.51
2	6 43 16.59	17.23	+23 4 46.8	46.2	10.332	−10.68	+3 42.56	15 45.69	1 8.72	6 39 34.06

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

SOLAR EPHEMERIS, 1914.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 39 8.48	9.09	+23 8 51.1	50.6	10.344	− 9.68	+3 31.01	15 45.70	1 8.75	6 35 37.51
2	6 43 16.59	17.23	23 4 46.8	46.2	10.332	10.68	3 42.56	15 45.69	1 8.72	6 39 34.06
3	6 47 24.42	25.09	23 0 18.3	17.6	10.319	11.67	3 53.83	15 45.69	1 8.69	6 43 30.62
4	6 51 31.94	32.64	22 55 25.8	25.0	10.306	12.67	4 4.79	15 45.69	1 8.65	6 47 27.18
5	6 55 39.15	39.88	22 50 9.4	8.5	10.293	13.67	4 15.43	15 45.70	1 8.61	6 51 23.74
6	6 59 46.02	46.78	+22 44 29.2	28.2	10.279	−14.66	+4 25.74	15 45.71	1 8.56	6 55 20.30
7	7 3 52.53	53.32	22 38 25.5	24.3	10.264	15.65	4 35.70	15 45.72	1 8.51	6 59 16.86
8	7 7 58.68	59.50	22 31 58.2	56.9	10.249	16.63	4 45.30	15 45.74	1 8.46	7 3 13.41
9	7 12 4.45	5.29	22 25 7.5	6.1	10.233	17.60	4 54.51	15 45.76	1 8.40	7 7 9.97
10	7 16 9.82	10.69	22 17 53.6	52.1	10.216	18.56	5 3.32	15 45.79	1 8.34	7 11 6.53
11	7 20 14.79	15.68	+22 10 16.7	15.0	10.198	−19.51	+5 11.73	15 45.82	1 8.28	7 15 3.09
12	7 24 19.34	20.25	22 2 16.9	15.0	10.180	20.46	5 19.72	15 45.85	1 8.22	7 18 59.65
13	7 28 23.45	24.38	21 53 54.3	52.3	10.162	21.41	5 27.28	15 45.89	1 8.15	7 22 56.20
14	7 32 27.12	28.06	21 45 9.1	7.0	10.143	22.35	5 34.39	15 45.93	1 8.09	7 26 52.76
15	7 36 30.33	31.29	21 35 61.6	59.4	10.124	23.28	5 41.03	15 45.97	1 8.02	7 30 49.32
16	7 40 33.06	34.04	+21 26 31.9	29.6	10.104	−24.19	+5 47.20	15 46.01	1 7.95	7 34 45.88
17	7 44 35.29	36.28	21 16 40.3	37.9	10.083	25.10	5 52.88	15 46.06	1 7.88	7 38 42.44
18	7 48 37.02	38.02	21 6 27.0	24.5	10.061	26.00	5 58.05	15 46.11	1 7.80	7 42 39.00
19	7 52 38.23	39.24	20 55 52.1	49.5	10.039	26.90	6 2.70	15 46.17	1 7.73	7 46 35.55
20	7 56 38.92	39.94	20 44 56.0	53.2	10.017	27.78	6 6.82	15 46.24	1 7.65	7 50 32.11
21	8 0 39.07	40.09	+20 33 38.8	35.9	9.994	−28.64	+6 10.41	15 46.32	1 7.57	7 54 28.67
22	8 4 38.66	39.69	20 21 60.8	57.8	9.971	29.50	6 13.44	15 46.40	1 7.49	7 58 25.22
23	8 8 37.68	38.71	20 9 62.3	59.2	9.947	30.36	6 15.90	15 46.48	1 7.41	8 2 21.78
24	8 12 36.11	37.14	19 57 43.5	40.3	9.923	31.20	6 17.78	15 46.57	1 7.33	8 6 18.34
25	8 16 33.96	34.99	19 45 4.8	1.4	9.898	32.03	6 19.07	15 46.67	1 7.24	8 10 14.90
26	8 20 31.21	32.24	+19 32 6.3	2.8	9.873	−32.84	+6 19.76	15 46.77	1 7.16	8 14 11.45
27	8 24 27.85	28.88	19 18 48.4	44.9	9.847	33.64	6 19.84	15 46.88	1 7.07	8 18 8.01
28	8 28 23.88	24.91	19 5 11.5	7.9	9.821	34.43	6 19.31	15 46.99	1 6.99	8 22 4.57
29	8 32 19.28	20.31	18 51 15.7	12.0	9.795	35.20	6 18.16	15 47.10	1 6.90	8 26 1.12
30	8 36 14.06	15.08	18 36 61.5	57.7	9.769	35.97	6 16.38	15 47.22	1 6.82	8 29 57.68
31	8 40 8.21	9.22	+18 22 28.9	25.1	9.743	−36.72	+6 13.97	15 47.34	1 6.73	8 33 54.24
Aug. 1	8 44 1.74	2.74	18 7 38.4	34.5	9.717	37.46	6 10.94	15 47.46	1 6.65	8 37 50.80
2	8 47 54.65	55.64	17 52 30.2	26.3	9.692	38.20	6 7.28	15 47.59	1 6.56	8 41 47.35
3	8 51 46.95	47.93	17 37 4.6	0.6	9.667	38.92	6 3.01	15 47.72	1 6.47	8 45 43.91
4	8 55 38.63	39.60	17 21 21.8	17.9	9.641	39.63	5 58.14	15 47.86	1 6.38	8 49 40.46
5	8 59 29.70	30.65	+17 5 22.2	18.3	9.616	−40.33	+5 52.65	15 48.00	1 6.29	8 53 37.02
6	9 3 20.17	21.10	16 49 6.1	2.2	9.591	41.02	5 46.56	15 48.14	1 6.20	8 57 33.58
7	9 7 10.05	10.95	16 32 33.6	29.7	9.566	41.68	5 39.89	15 48.28	1 6.11	9 1 30.14
8	9 10 59.35	60.22	16 15 45.1	41.2	9.542	42.34	5 32.63	15 48.43	1 6.03	9 5 26.69
9	9 14 48.07	48.92	15 58 40.8	36.9	9.518	42.99	5 24.79	15 48.57	1 5.94	9 9 23.25
10	9 18 36.22	37.05	+15 41 21.1	17.2	9.495	−43.63	+5 16.39	15 48.72	1 5.86	9 13 19.80
11	9 22 23.81	24.61	15 23 46.3	42.4	9.472	44.26	5 7.43	15 48.87	1 5.77	9 17 16.36
12	9 26 10.85	11.62	15 5 56.5	52.7	9.449	44.87	4 57.90	15 49.03	1 5.69	9 21 12.92
13	9 29 57.34	58.09	14 47 52.1	48.4	9.427	45.48	4 47.83	15 49.20	1 5.61	9 25 9.47
14	9 33 43.30	44.02	14 29 33.5	29.9	9.405	46.07	4 37.23	15 49.37	1 5.53	9 29 6.02
15	9 37 28.73	29.42	+14 10 60.9	57.4	9.383	−46.64	+4 26.11	15 49.54	1 5.45	9 33 2.58
16	9 41 13.64	14.30	+13 52 14.6	11.3	9.361	−47.20	+4 14.47	15 49.71	1 5.38	9 36 59.14

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

[Eph 14]

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug. 16	9 41 13.64	14.30	+13 52 14.6	11.3	9.361	−47.20	+ 4 14.47	15 49.71	1 5.38	9 36 59.14
17	9 44 58.04	58.67	13 33 15.0	11.9	9.340	47.75	4 2.32	15 49.88	1 5.31	9 40 55.69
18	9 48 41.94	42.53	13 13 62.4	59.4	9.319	48.29	3 49.66	15 50.06	1 5.24	9 44 52.25
19	9 52 25.35	25.90	12 54 37.1	34.1	9.299	48.82	3 36.51	15 50.24	1 5.17	9 48 48.80
20	9 56 8.27	8.78	12 34 59.4	56.6	9.279	49.33	3 22.88	15 50.43	1 5.10	9 52 45.36
21	9 59 50.71	51.19	+12 15 9.7	7.1	9.259	−49.82	+ 3 8.77	15 50.62	1 5.03	9 56 41.91
22	10 3 32.68	33.13	11 55 8.4	5.9	9.239	50.29	2 54.19	15 50.82	1 4.96	10 0 38.47
23	10 7 14.20	14.61	11 34 55.8	53.5	9.220	50.75	2 39.15	15 51.02	1 4.89	10 4 35.02
24	10 10 55.26	55.63	11 14 32.2	30.2	9.201	51.20	2 23.66	15 51.23	1 4.83	10 8 31.58
25	10 14 35.88	36.21	10 53 58.0	56.2	9.183	51.64	2 7.73	15 51.45	1 4.77	10 12 28.13
26	10 18 16.08	16.36	+10 33 13.5	11.9	9.166	−52.06	+ 1 51.37	15 51.67	1 4.71	10 16 24.69
27	10 21 55.86	56.10	10 12 19.1	17.7	9.149	52.46	1 34.59	15 51.89	1 4.65	10 20 21.24
28	10 25 35.23	35.43	9 51 15.1	13.9	9.133	52.85	1 17.41	15 52.11	1 4.59	10 24 17.80
29	10 29 14.21	14.37	9 30 1.8	0.8	9.117	53.23	0 59.85	15 52.33	1 4.54	10 28 14.35
30	10 32 52.83	52.94	9 8 39.6	38.9	9.102	53.60	0 41.91	15 52.56	1 4.49	10 32 10.91
31	10 36 31.09	31.15	+ 8 47 8.8	8.4	9.088	−53.95	+ 0 23.62	15 52.78	1 4.44	10 36 7.46
Sept. 1	10 40 9.02	9.03	8 25 29.6	29.5	9.074	54.29	+ 0 5.01	15 53.01	1 4.39	10 40 4.02
2	10 43 46.63	46.60	8 3 42.3	42.4	9.061	54.62	− 0 13.93	15 53.24	1 4.35	10 44 0.57
3	10 47 23.95	23.88	7 41 47.3	47.7	9.050	54.94	0 33.16	15 53.48	1 4.31	10 47 57.12
4	10 51 1.00	0.87	7 19 44.9	45.7	9.039	55.24	0 52.66	15 53.71	1 4.27	10 51 53.68
5	10 54 37.80	37.62	+ 6 57 35.4	36.5	9.029	−55.53	− 1 12.41	15 53.95	1 4.23	10 55 50.23
6	10 58 14.37	14.14	6 35 19.0	20.4	9.020	55.82	1 32.39	15 54.18	1 4.20	10 59 46.79
7	11 1 50.73	50.45	6 12 56.0	57.7	9.012	56.09	1 52.57	15 54.42	1 4.17	11 3 43.34
8	11 5 26.90	26.57	5 50 26.7	28.7	9.004	56.34	2 12.94	15 54.66	1 4.14	11 7 39.89
9	11 9 2.90	2.52	5 27 51.4	53.7	8.997	56.58	2 33.48	15 54.90	1 4.12	11 11 36.45
10	11 12 38.76	38.33	+ 5 5 10.5	13.1	8.991	−56.81	− 2 54.18	15 55.14	1 4.10	11 15 33.00
11	11 16 14.49	14.00	4 42 24.4	27.3	8.986	57.02	3 15.01	15 55.39	1 4.08	11 19 29.56
12	11 19 50.11	49.57	4 19 33.2	36.5	8.982	57.22	3 35.94	15 55.63	1 4.06	11 23 26.11
13	11 23 25.65	25.06	3 56 37.4	41.0	8.979	57.41	3 56.95	15 55.88	1 4.04	11 27 22.66
14	11 27 1.11	0.47	3 33 37.2	41.2	8.977	57.58	4 18.04	15 56.13	1 4.03	11 31 19.22
15	11 30 36.53	35.84	+ 3 10 33.1	37.5	8.975	−57.74	− 4 39.18	15 56.38	1 4.02	11 35 15.77
16	11 34 11.91	11.17	2 47 25.3	30.1	8.974	57.89	5 0.34	15 56.63	1 4.01	11 39 12.32
17	11 37 47.28	46.49	2 24 14.2	19.4	8.974	58.03	5 21.51	15 56.89	1 4.01	11 43 8.88
18	11 41 22.66	21.81	2 1 0.1	5.7	8.974	58.15	5 42.68	15 57.15	1 4.01	11 47 5.43
19	11 44 58.06	57.15	1 37 43.4	49.3	8.975	58.24	6 3.84	15 57.41	1 4.01	11 51 1.98
20	11 48 33.50	32.54	+ 1 14 24.5	30.7	8.977	−58.32	− 6 24.96	15 57.68	1 4.02	11 54 58.54
21	11 52 8.99	7.98	0 51 3.8	10.4	8.980	58.37	6 46.02	15 57.95	1 4.03	11 58 55.09
22	11 55 44.54	43.48	0 27 41.7	48.7	8.984	58.43	7 7.00	15 58.22	1 4.04	12 2 51.64
23	11 59 20.18	19.07	+ 0 4 18.5	25.8	8.988	58.47	7 27.90	15 58.49	1 4.06	12 6 48.20
24	12 2 55.92	54.76	− 0 18 65.4	57.8	8.992	58.50	7 48.70	15 58.77	1 4.08	12 10 44.75
25	12 6 31.79	30.57	− 0 42 29.7	21.8	8.997	−58.51	− 8 9.39	15 59.05	1 4.10	12 14 41.31
26	12 10 7.79	6.52	1 5 54.0	45.8	9.003	58.50	8 29.94	15 59.32	1 4.13	12 18 37.86
27	12 13 43.96	42.64	1 29 18.0	9.4	9.011	58.48	8 50.33	15 59.60	1 4.16	12 22 34.41
28	12 17 20.31	18.94	1 52 41.3	32.4	9.019	58.45	9 10.53	15 59.88	1 4.19	12 26 30.97
29	12 20 56.86	55.44	2 15 63.7	54.4	9.028	58.41	9 30.53	16 0.16	1 4.22	12 30 27.52
30	12 24 33.64	32.17	− 2 39 24.7	15.1	9.038	−58.34	− 9 50.30	16 0.44	1 4.26	12 34 24.07
Oct. 1	12 28 10.67	9.14	− 3 2 44.1	34.2	9.048	−58.26	−10 9.81	16 0.72	1 4.30	12 38 20.63

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noo
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 28 10.67	9.14	− 3 2 44.1	34.2	9.048	−58.26	−10 9.81	16 0.72	1 4.30	12 38 20.
2	12 31 47.97	46.39	3 25 61.4	51.4	9.061	58.18	10 29.06	16 1.00	1 4.34	12 42 17.
3	12 35 25.57	23.94	3 49 16.5	6.1	9.074	58.08	10 48.02	16 1.28	1 4.39	12 46 13.7
4	12 39 3.49	1.81	4 12 28.9	18.2	9.087	57.95	11 6.65	16 1.56	1 4.44	12 50 10.
5	12 42 41.75	40.02	4 35 38.3	27.4	9.102	57.82	11 24.94	16 1.83	1 4.49	12 54 6.8
6	12 46 20.38	18.60	− 4 58 44.5	33.4	9.118	−57.68	−11 42.86	16 2.11	1 4.54	12 58 3.4
7	12 49 59.40	57.57	5 21 47.1	35.7	9.135	57.52	12 0.40	16 2.38	1 4.60	13 1 59.9
8	12 53 38.83	36.95	5 44 45.6	34.0	9.152	57.35	12 17.53	16 2.65	1 4.66	13 5 56.5
9	12 57 18.69	16.77	6 7 39.8	27.8	9.170	57.16	12 34.22	16 2.92	1 4.72	13 9 53.0
10	13 0 59.01	57.04	6 30 29.2	17.0	9.189	56.95	12 50.45	16 3.19	1 4.79	13 13 49.6
11	13 4 39.80	37.78	− 6 53 13.6	1.3	9.209	−56.73	−13 6.22	16 3.46	1 4.86	13 17 46.1
12	13 8 21.09	19.03	7 15 52.5	40.0	9.231	56.50	13 21.50	16 3.73	1 '4.93	13 21 42.7
13	13 12 2.88	0.79	7 38 25.6	12.8	9.253	56.24	13 36.26	16 4.00	1 5.01	13 25 39.27
14	13 15 45.21	43.08	8 0 52.5	39.6	9.275	55.98	13 50.48	16 4.27	1 5.09	13 29 35.8
15	13 19 28.10	25.92	8 22 72.9	59.9	9.298	55.70	14 4.14	16 4.54	1 5.17	13 33 32.3
16	13 23 11.56	9.34	− 8 45 26.3	13.1	9.322	−55.40	−14 17.24	16 4.81	1 5.25	13 37 28.0
17	13 26 55.60	53.34	9 7 32.3	19.0	9.347	55.08	14 29.76	16 5.09	1 5.33	13 41 25.4
18	13 30 40.24	37.94	9 29 30.4	17.0	9.372	54.75	14 41.69	16 5.36	1 5.42	13 45 22.0
19	13 34 25.48	23.15	9 51 20.3	6.8	9.398	54.40	14 53.01	16 5.63	1 5.51	13 49 18.6
20	13 38 11.34	8.97	10 12 61.5	48.0	9.424	54.04	15 3.71	16 5.90	1 5.60	13 53 15.1
21	13 41 57.84	55.44	−10 34 33.6	20.0	9.451	−53.65	−15 13.77	16 6.17	1 5.69	13 57 11.7
22	13 45 44.99	42.56	10 55 56.2	42.6	9.478	53.24	15 23.19	16 6.44	1 5.79	14 1 8.2
23	13 49 32.78	30.32	11 16 68.9	55.3	9.505	52.82	15 31.95	16 6.71	1 5.89	14 5 4.82
24	13 53 21.24	18.76	11 37 71.3	57.6	9.533	52.38	15 40.04	16 6.98	1 5.99	14 9 1.37
25	13 57 10.39	7.88	11 58 63.0	49.3	9.562	51.92	15 47.45	16 7.25	1 6.09	14 12 57.93
26	14 0 60.23	57.69	−12 19 43.5	29.8	9.591	−51.45	−15 54.17	16 7.52	1 6.20	14 16 54.48
27	14 4 50.78	48.21	12 39 72.5	58.9	9.621	50.97	16 0.19	16 7.79	1 6.31	14 20 51.04
28	14 8 42.05	39.46	13 0 29.7	16.1	9.652	50.46	16 5.49	16 8.05	1 6.41	14 24 47.59
29	14 12 34.07	31.46	13 20 34.6	21.1	9.683	49.94	16 10.04	16 8.31	1 6.52	14 28 44.15
30	14 16 26.84	24.21	13 40 26.8	13.4	9.715	49.41	16 13.84	16 8.57	1 6.63	14 32 40.70
31	14 20 20.36	17.71	−13 59 66.0	52.7	9.747	−48.86	−16 16.88	16 8.82	1 6.74	14 36 37.26
Nov. 1	14 24 14.65	11.98	14 19 31.8	18.6	9.779	48.29	16 19.15	16 9.07	1 6.85	14 40 33.82
2	14 28 9.74	7.05	14 38 43.8	30.7	9.812	47.70	16 20.62	16 9.32	1 6.96	14 44 30.37
3	14 32 5.64	2.94	14 57 41.6	28.6	9.846	47.10	16 21.29	16 9.57	1 7.08	14 48 26.93
4	14 35 62.35	59.65	15 16 24.8	12.0	9.880	46.48	16 21.14	16 9.82	1 7.20	14 52 23.48
5	14 39 59.88	57.18	−15 34 53.0	40.5	9.914	−45.85	−16 20.16	16 10.06	1 7.32	14 56 20.04
6	14 43 58.25	55.55	15 52 65.8	53.6	9.949	45.21	16 18.36	16 10.30	1 7.44	15 0 16.60
7	14 47 57.46	54.76	16 10 62.9	50.9	9.984	44.54	16 15.72	16 10.53	1 7.56	15 4 13.15
8	14 51 57.52	54.83	16 28 43.9	32.0	10.020	43.86	16 12.22	16 10.76	1 7.68	15 8 9.71
9	14 55 58.44	55.76	16 45 68.3	56.6	10.056	43.16	16 7.86	16 10.99	1 7.80	15 12 6.26
10	14 59 60.23	57.55	−17 3 15.8	4.4	10.092	−42.44	−16 2.64	16 11.22	1 7.92	15 16 2.82
11	15 4 2.89	0.20	17 19 65.8	54.7	10.128	41.70	15 56.55	16 11.44	1 8.04	15 19 59.38
12	15 8 6.41	3.72	17 36 38.0	27.1	10.164	40.95	15 49.60	16 11.66	1 8.16	15 23 55.94
13	15 12 10.80	8.12	17 52 52.0	41.4	10.200	40.19	15 41.78	16 11.87	1 8.28	15 27 52.49
14	15 16 16.06	13.39	18 8 47.4	37.1	10.236	39.41	15 33.08	16 12.08	1 8.39	15 31 49.05
15	15 20 22.19	19.54	−18 24 23.8	13.8	10.272	−38.61	−15 23.52	16 12.29	1 8.51	15 35 45.60
16	15 24 29.17	26.55	−18 39 40.8	31.1	10.308	−37.80	−15 13.10	16 12.50	1 8.63	15 39 42.16

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 16	15 24 29.17	26.55	−18 39 40.8	31.1	10.308	−37.80	−15 13.10	16 12.50	1 8.63	15 39 42.16
17	15 28 37.00	34.40	18 54 38.0	28.6	10.343	36.96	15 1.84	16 12.71	1 8.75	15 43 38.72
18	15 32 45.67	43.09	19 9 14.9	5.9	10.378	36.10	14 49.74	16 12.91	1 8.86	15 47 35.28
19	15 36 55.16	52.61	19 23 31.0	22.5	10.412	35.23	14 36.81	16 13.12	1 8.97	15 51 31.83
20	15 41 5.47	2.95	19 37 26.1	17.9	10.446	34.35	14 23.07	16 13.32	1 9.09	15 55 28.39
21	15 45 16.58	14.10	−19 50 59.8	51.9	10.479	−33.45	−14 8.53	16 13.52	1 9.20	15 59 24.95
22	15 49 28.48	26.04	20 4 11.7	4.1	10.512	32.53	13 53.19	16 13.72	1 9.31	16 3 21.50
23	15 53 41.15	38.76	20 16 61.5	54.3	10.544	31.60	13 37.07	16 13.91	1 9.42	16 7 18.06
24	15 57 54.59	52.25	20 29 28.8	21.9	10.576	30.66	13 20.19	16 14.10	1 9.52	16 11 14.62
25	16 2 8.78	6.49	20 41 33.2	26.7	10.607	29.71	13 2.56	16 14.29	1 9.63	16 15 11.18
26	16 6 23.71	21.47	−20 53 14.5	8.4	10.637	−28.74	−12 44.19	16 14.48	1 9.73	16 19 7.74
27	16 10 39.37	37.18	21 4 32.3	26.6	10.667	27.76	12 25.09	16 14.66	1 9.84	16 23 4.30
28	16 14 55.74	53.60	21 15 26.3	21.0	10.696	26.75	12 5.28	16 14.83	1 9.94	16 27 0.85
29	16 19 12.81	10.71	21 25 56.3	51.3	10.725	25.73	11 44.77	16 15.00	1 10.04	16 30 57.41
30	16 23 30.55	28.50	21 35 61.9	57.2	10.753	24.71	11 23.59	16 15.16	1 10.13	16 34 53.97
Dec. 1	16 27 48.96	46.97	−21 45 42.8	38.5	10.781	−23.69	−11 1.74	16 15.32	1 10.22	16 38 50.53
2	16 32 8.02	6.10	21 54 58.8	54.9	10.808	22.64	10 39.24	16 15.47	1 10.31	16 42 47.09
3	16 36 27.71	25.86	22 3 49.5	45.9	10.833	21.58	10 16.11	16 15.62	1 10.39	16 46 43.64
4	16 40 48.01	46.22	22 12 14.8	11.5	10.858	20.51	9 52.36	16 15.76	1 10.47	16 50 40.20
5	16 45 8.90	7.18	22 20 14.4	11.4	10.882	19.44	9 28.03	16 15.90	1 10.54	16 54 36.76
6	16 49 30.36	28.71	−22 27 48.0	45.3	10.906	−18.36	− 9 3.13	16 16.03	1 10.62	16 58 33.32
7	16 53 52.36	50.80	22 34 55.3	52.9	10.928	17.25	8 37.68	16 16.16	1 10.69	17 2 29.88
8	16 58 14.89	13.40	22 41 36.1	33.9	10.949	16.14	8 11.70	16 16.28	1 10.76	17 6 26.44
9	17 2 37.93	36.50	22 47 50.3	48.3	10.969	15.03	7 45.22	16 16.39	1 10.83	17 10 23.00
10	17 7 1.43	0.08	22 53 37.6	35.9	10.989	13.91	7 18.27	16 16.50	1 10.89	17 14 19.56
11	17 11 25.38	24.12	−22 58 57.8	56.4	11.007	−12.78	− 6 50.87	16 16.61	1 10.94	17 18 16.12
12	17 15 49.74	48.57	23 3 50.7	49.5	11.023	11.64	6 23.06	16 16.71	1 10.99	17 22 12.68
13	17 20 14.49	13.41	23 8 16.1	15.1	11.038	10.49	5 54.86	16 16.81	1 11.04	17 26 9.23
14	17 24 39.59	38.60	23 12 14.0	13.1	11.052	9.34	5 26.31	16 16.91	1 11.08	17 30 5.79
15	17 29 5.00	4.10	23 15 44.1	43.4	11.064	8.17	4 57.45	16 17.00	1 11.12	17 34 2.35
16	17 33 30.68	29.87	−23 18 46.3	45.8	11.075	− 7.01	− 4 28.32	16 17.09	1 11.15	17 37 58.91
17	17 37 56.60	55.87	23 21 20.5	20.1	11.084	5.84	3 58.95	16 17.18	1 11.18	17 41 55.47
18	17 42 22.72	22.07	23 23 26.5	26.2	11.091	4.67	3 29.37	16 17.26	1 11.20	17 45 52.03
19	17 46 49.00	48.44	23 25 4.3	4.1	11.097	3.49	2 59.65	16 17.33	1 11.22	17 49 48.58
20	17 51 15.40	14.94	23 26 14.0	13.9	11.102	2.32	2 29.80	16 17.40	1 11.24	17 53 45.14
21	17 55 41.88	41.51	−23 26 55.5	55.4	11.104	− 1.14	− 1 59.86	16 17.47	1 11.25	17 57 41.70
22	18 0 8.40	8.12	23 27 8.6	8.5	11.105	+ 0.04	1 29.88	16 17.53	1 11.26	18 1 38.26
23	18 4 34.94	34.76	23 26 53.4	53.3	11.104	1.22	0 59.89	16 17.59	1 11.26	18 5 34.82
24	18 9 1.46	1.37	23 26 9.8	9.8	11.103	2.40	0 29.93	16 17.65	1 11.26	18 9 31.38
25	18 13 27.92	27.91	23 24 58.1	58.1	11.100	3.57	− 0 0.03	16 17.70	1 11.25	18 13 27.94
26	18 17 54.28	54.36	−23 23 18.2	18.2	11.096	+ 4.75	+ 0 29.78	16 17.75	1 11.24	18 17 24.50
27	18 22 20.52	20.69	23 21 10.2	10.1	11.090	5.92	0 59.47	16 17.79	1 11.22	18 21 21.06
28	18 26 46.60	46.87	23 18 34.0	33.8	11.082	7.09	1 29.01	16 17.83	1 11.20	18 25 17.62
29	18 31 12.50	12.87	23 15 29.8	29.5	11.074	8.26	1 58.36	16 17.85	1 11.17	18 29 14.18
30	18 35 38.18	38.64	23 11 57.8	57.4	11.065	9.42	2 27.49	16 17.87	1 11.14	18 33 10.74
31	18 40 3.61	4.16	−23 7 57.9	57.4	11.054	+10.56	+ 2 56.38	16 17.89	1 11.11	18 37 7.29
32	18 44 28.76	29.40	−23 3 30.2	29.5	11.042	+11.71	+ 3 24.99	16 17.90	1 11.07	18 41 3.85

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 0	L	15 50.93	1.716	22 31 35.99	113.07	−10 21 22.2	+ 836.2	62.66	14 56.5	54 44.4	I. S.
1	U	4 11.23	1.671	22 53 55.97	110.38	7 32 12.1	854.3	61.93	14 53.5	54 33.3	I. S.
1	L	16 31.08	1.639	23 15 48.27	108.47	4 40 9.3	865.1	61.40	14 51.1	54 24.5	I. S.
2	U	4 50.62	1.620	23 37 22.15	107.31	− 1 46 36.0	869.5	61.09	14 49.4	54 18.2	I. S.
2	L	17 10.00	1.614	23 58 46.88	106.95	+ 1 7 13.9	+ 867.9	61.00	14 48.4	54 14.5	I. S.
3	U	5 29.39	1.620	0 20 11.68	107.33	4 0 9.7	860.5	61.13	14 48.1	54 13.6	I. S.
3	L	17 48.94	1.639	0 41 45.79	108.49	6 51 2.1	847.2	61.47	14 48.6	54 15.4	I. S.
4	U	6 8.79	1.671	1 3 38.44	110.41	9 38 39.5	827.8	62.02	14 49.9	54 20.1	I. S.
4	L	18 29.10	1.716	1 25 58.79	113.10	+12 21 44.7	+ 801.7	62.78	14 51.9	54 27.6	I. S.
5	U	6 50.02	1.773	1 48 55.88	116.55	14 58 51.8	768.0	63.75	14 54.7	54 37.7	I. S.
5	L	19 11.70	1.842	2 12 38.45	120.69	17 28 23.5	725.8	64.88	14 58.2	54 50.5	I. S.
6	U	7 34.27	1.921	2 37 14.66	125.47	19 48 28.8	673.4	66.16	15 2.3	55 5.7	I. S.
6	L	19 57.85	2.010	3 2 51.55	130.77	+21 57 0.9	+ 610.0	67.57	15 7.1	55 23.1	I. S.
7	U	8 22.53	2.104	3 29 34.44	136.42	23 51 37.8	534.0	69.02	15 12.3	55 42.4	I. S.
7	L	20 48.35	2.199	3 57 26.16	142.18	25 29 44.2	444.8	70.48	15 18.0	56 3.3	I. S.
8	U	9 15.30	2.291	4 26 26.02	147.73	26 48 36.7	341.7	71.85	15 24.0	56 25.4	I. *N*.S.
8	L	21 43.30	2.374	4 56 29.16	152.68	+27 45 32.0	+ 225.4	73.06	15 30.3	56 48.3	I. N.*S*.
9	U	10 12.20	2.440	5 27 26.10	156.63	28 17 59.9	+ 97.5	74.00	15 36.6	57 11.6	I. N.*S*.
9	L	22 41.76	2.483	5 59 2.88	159.25	28 23 57.2	− 39.1	74.61	15 42.8	57 34.6	I. N.
10	U	11 11.70	2.502	6 31 2.20	160.35	28 2 1.7	180.6	74.87	15 49.0	57 56.9	I. N.
10	L	23 41.70	2.494	7 3 5.14	159.87	+27 11 43.5	− 322.1	74.74	15 54.7	58 18.0	I. N.
11	U	12 11.45	2.462	7 34 53.38	157.95	25 53 29.5	459.0	74.26	16 0.0	58 37.3	*I*. II. N.
12	L	0 40.69	2.410	8 6 11.30	154.87	24 8 42.5	586.9	73.51	16 4.7	58 54.5	II. N.*S*.
12	U	13 9.24	2.347	8 36 47.36	151.04	21 59 33.0	702.3	72.57	16 8.7	59 9.3	II. *N*.S.
13	L	1 36.99	2.277	9 6 34.88	146.86	+19 28 46.4	− 802.7	71.54	16 12.0	59 21.5	II. S.
13	U	14 3.90	2.208	9 35 31.89	142.69	16 39 31.8	886.8	70.50	16 14.5	59 30.7	II. S.
14	L	2 30.00	2.144	10 3 40.47	138.83	13 35 9.7	954.0	69.54	16 16.2	59 37.0	II. S.
14	U	14 55.38	2.089	10 31 5.96	135.53	10 19 3.2	1004.3	68.71	16 17.2	59 40.4	II. S.
15	L	3 20.17	2.046	10 57 56.01	132.93	+ 6 54 31.8	−1038.3	68.06	16 17.4	59 41.3	II. S.
15	U	15 44.53	2.016	11 24 19.84	131.17	+ 3 24 48.5	1056.4	67.62	16 16.9	59 39.6	II. S.
16	L	4 8.63	2.001	11 50 27.65	130.27	− 0 7 2.0	1059.5	67.41	16 15.9	59 35.7	II. S.
16	U	16 32.63	2.001	12 16 30.08	130.27	3 38 2.6	1048.1	67.44	16 14.3	59 29.9	II. S.
17	L	4 56.72	2.016	12 42 37.84	131.15	− 7 5 21.9	−1022.8	67.70	16 12.3	59 22.4	II. S.
17	U	17 21.08	2.045	13 9 1.36	132.89	10 26 13.2	983.5	68.17	16 9.8	59 13.5	II. S.
18	L	5 45.85	2.087	13 35 50.37	135.40	13 37 51.3	930.4	68.84	16 7.1	59 3.5	II. S.
18	U	18 11.20	2.139	14 3 13.43	138.57	16 37 31.8	864.0	69.66	16 4.1	58 52.6	II. S.
19	L	6 37.22	2.199	14 31 17.38	142.18	−19 22 30.8	− 783.6	70.59	16 1.0	58 40.9	II. S.
19	U	19 3.99	2.263	15 0 6.61	146.06	21 50 5.0	689.8	71.56	15 57.6	58 28.6	II. S.
20	L	7 31.54	2.327	15 29 42.26	149.86	23 57 36.8	583.4	72.50	15 54.1	58 15.8	II. S.
20	U	19 59.82	2.384	16 0 1.60	153.26	25 42 40.0	465.4	73.32	15 50.5	58 2.6	II. S.
21	L	8 28.70	2.427	16 30 57.60	155.89	−27 3 8.4	− 338.0	73.94	15 46.8	57 49.0	II. S.
21	U	20 58.00	2.453	17 2 18.93	157.43	27 57 25.7	204.2	74.29	15 43.0	57 35.0	II. *N*.
22	L	9 27.48	2.456	17 33 50.81	157.63	28 24 35.3	− 67.4	74.30	15 39.1	57 20.6	II. N.
22	U	21 56.86	2.435	18 5 16.42	156.39	28 24 26.9	+ 68.2	73.95	15 35.1	57 6.0	II. N.
23	L	10 25.85	2.392	18 36 18.68	153.76	−27 57 38.9	+ 198.6	73.27	15 31.0	56 51.0	II. N.

Jan. 8, U Defective Illumination of *N* 0″.45
Jan. 9, U Defective Illumination of *S* 1″.04
Jan. 11, U Defective Illumination of *I* 0″.00
Jan. 12, U Defective Illumination of *N* 0″.08

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan 23	L	10 25.85	2.392	18 36 18.68	153.76	−27 57 38.9	+ 198.6	73.27	15 31.0	56 51.0	II. N.
23	U	22 54.19	2.329	19 6 42.19	149.97	27 5 33.9	320.5	72.30	15 26.9	56 35.9	II. N.
24	L	11 21.68	2.252	19 36 14.66	145.31	25 50 12.0	431.1	71.10	15 22.7	56 20.6	
24	U	23 48.19	2.166	20 4 47.79	140.14	24 13 58.3	528.9	69.77	15 18.6	56 5.3	
25	L	12 13.64	2.076	20 32 17.35	134.78	−22 19 32.7	+ 613.1	68.37	15 14.4	55 50.1	
26	U	0 38.03	1.989	20 58 42.95	129.52	20 9 37.2	683.8	66.97	15 10.3	55 35.2	
26	L	13 1.40	1.907	21 24 7.10	124.58	17 46 51.0	741.7	65.65	15 6.4	55 20.8	
27	U	1 23.83	1.833	21 48 34.69	120.11	15 13 43.2	787.6	64.45	15 2.7	55 7.0	I. S.
27	L	13 45.42	1.768	22 12 12.18	116.23	−12 32 30.1	+ 822.7	63.40	14 59.2	54 54.3	I. S.
28	U	2 6.31	1.715	22 35 7.06	113.02	9 45 14.6	848.2	62.51	14 56.0	54 42.5	I. S.
28	L	14 26.62	1.673	22 57 27.37	110.49	6 53 47.5	864.9	61.81	14 53.1	54 32.0	I. S.
29	U	2 46.50	1.642	23 19 21.52	108.66	3 59 47.0	873.9	61.33	14 50.8	54 23.3	I. S.
29	L	15 6.08	1.624	23 40 58.01	107.54	− 1 4 42.1	+ 875.9	61.04	14 48.9	54 16.3	I. S.
30	U	3 25.51	1.617	0 2 25.45	107.15	+ 1 50 6.2	871.1	60.96	14 47.5	54 11.3	I. S.
30	L	15 44.94	1.623	0 23 52.46	107.48	4 43 21.2	860.3	61.09	14 46.7	54 8.5	I. S.
31	U	4 4.50	1.640	0 45 27.67	108.51	7 33 48.9	843.3	61.42	14 46.6	54 8.1	I. S.
31	L	16 24.34	1.669	1 7 19.70	110.28	+10 20 15.5	+ 820.1	61.96	14 47.2	54 10.3	I. S.
Feb 1	U	4 44.60	1.710	1 29 37.18	112.76	13 1 23.4	790.2	62.70	14 48.6	54 15.3	I. S.
1	L	17 5.43	1.763	1 52 28.59	115.94	15 35 49.3	753.0	63.63	14 50.6	54 22.7	I. S.
2	U	5 26.96	1.827	2 16 2.20	119.79	18 2 1.4	707.6	64.72	14 53.4	54 32.8	I. S.
2	L	17 49.32	1.901	2 40 25.70	124.25	+20 18 16.9	+ 653.3	65.95	14 56.9	54 45.7	I. S.
3	U	6 12.62	1.984	3 5 45.92	129.22	22 22 40.6	588.8	67.29	15 1.1	55 1.2	I. S.
3	L	18 36.96	2.073	3 32 8.20	134.55	24 13 3.9	513.1	68.70	15 6.0	55 19.4	I. S.
4	U	7 2.38	2.164	3 59 35.64	140.03	25 47 6.4	425.2	70.13	15 11.7	55 40.1	I. S.
4	L	19 28.88	2.253	4 28 8.52	145.39	+27 2 19.2	+ 324.8	71.49	15 18.0	56 3.1	I. S.
5	U	7 56.41	2.334	4 57 43.38	150.29	27 56 10.9	211.9	72.69	15 24.7	56 27.9	I. *N*.S.
5	L	20 24.85	2.402	5 28 12.70	154.41	28 26 18.4	+ 87.7	73.68	15 31.9	56 54.3	I. N.*S*.
6	U	8 54.01	2.452	5 59 24.87	157.40	28 30 37.6	− 45.8	74.39	15 39.4	57 21.7	I. N.
6	L	21 23.62	2.480	6 31 4.99	159.03	+28 7 36.9	− 185.1	74.75	15 47.0	57 49.6	I. N.
7	U	9 53.42	2.483	7 2 56.22	159.25	27 16 28.4	326.3	74.76	15 54.5	58 17.3	I. N.
7	L	22 23.13	2.464	7 34 41.69	158.11	25 57 15.5	465.1	74.45	16 1.9	58 44.2	I. N.
8	U	10 52.49	2.426	8 6 6.39	155.83	24 10 54.5	596.9	73.87	16 8.8	59 9.5	I. N.
8	L	23 21.31	2.376	8 36 58.60	152.76	+21 59 12.0	− 718.1	73.10	16 15.1	59 32.7	I. N.
9	U	11 49.46	2.317	9 7 10.87	149.25	19 24 36.4	825.3	72.19	16 20.6	59 53.0	I. N.
10	L	0 16.90	2.257	9 36 40.13	145.65	16 30 8.5	916.4	71.27	16 25.2	60 9.9	*I*. II. N.*S*.
10	U	12 43.65	2.201	10 5 27.27	142.27	13 19 11.5	990.0	70.42	16 28.8	60 22.9	II. *N*.S.
11	L	1 9.76	2.153	10 33 36.50	139.36	+ 9 55 21.5	−1045.3	69.68	16 31.1	60 31.7	II. S.
11	U	13 35.35	2.115	11 1 14.47	137.09	6 22 20.1	1081.9	69.09	16 32.3	60 36.1	II. S.
12	L	2 0.56	2.090	11 28 29.61	135.57	+ 2 43 49.2	1100.2	68.73	16 32.4	60 36.4	II. S.
12	U	14 25.55	2.078	11 55 31.41	134.87	− 0 56 33.1	1100.5	68.58	16 31.4	60 32.5	II. S.
13	L	2 50.48	2.080	12 22 29.78	135.00	− 4 35 15.0	−1083.6	68.64	16 29.2	60 24.7	II. S.
13	U	15 15.53	2.096	12 49 34.72	135.95	8 8 52.0	1049.9	68.93	16 26.2	60 13.6	II. S.
14	L	3 40.84	2.124	13 16 55.74	137.67	11 34 8.5	1000.1	69.41	16 22.4	59 59.5	II. S.
14	U	16 6.56	2.164	13 44 41.42	140.05	14 47 55.6	935.2	70.05	16 17.9	59 43.2	II. S.
15	L	4 32.80	2.212	14 12 58.85	142.93	−17 47 14.1	− 855.5	70.83	16 13.0	59 25.0	II. S.

Feb. 5, U Defective Illumination of *N* 1″.04

Feb. 10, U Defective Illumination of *N* 0″.23

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs. •
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 15	L	4 32.80	2.212	14 12 58.85	142.93	−17 47 14.1	−855.5	70.83	16 13.0	59 25.0	II. S.
15	U	16 59.66	2.265	14 41 52.95	146.11	20 29 13.5	762.2	71.67	16 7.7	59 5.5	II. S.
16	L	5 27.16	2.319	15 11 25.87	149.35	22 51 16.3	656.3	72.49	16 2.1	58 45.2	II. S.
16	U	17 55.29	2.368	15 41 36.38	152.32	24 50 59.9	539.4	73.25	15 56.5	58 24.5	II. S.
17	L	6 23.96	2.408	16 12 19.41	154.71	−26 26 24.4	−413.4	73.83	15 50.8	58 3.7	II. S.
17	U	18 53.02	2.433	16 43 26.06	156.21	27 35 57.7	281.1	74.20	15 45.3	57 43.3	II. S.
18	L	7 22.26	2.439	17 14 44.07	156.57	28 18 43.3	146.0	74.26	15 39.8	57 23.4	II. S.
18	U	19 51.46	2.424	17 45 58.92	155.67	28 34 25.1	− 11.3	74.02	15 34.6	57 4.1	II. N.
19	L	8 20.35	2.388	18 16 55.41	153.52	−28 23 29.1	+119.7	73.45	15 29.6	56 45.7	II. N.
19	U	20 48.70	2.334	18 47 19.16	150.25	27 47 1.6	243.5	72.60	15 24.8	56 28.1	II. N.
20	L	9 16.30	2.265	19 16 58.06	146.11	26 46 42.2	357.9	71.51	15 20.2	56 11.4	II. N.
20	U	21 43.01	2.186	19 45 43.30	141.37	25 24 36.7	461.0	70.26	15 15.9	55 55.6	II. N.
21	L	10 8.74	2.102	20 13 29.66	136.33	−23 43 6.3	+552.0	68.92	15 11.9	55 40.7	II. N.
21	U	22 33.46	2.018	20 40 15.35	131.29	21 44 39.6	630.3	67.55	15 8.0	55 26.7	II. N.
22	L	10 57.20	1.937	21 6 1.56	126.47	19 31 44.8	696.3	66.23	15 4.5	55 13.6	II. N.
22	U	23 20.00	1.864	21 30 51.86	122.01	17 6 45.5	751.2	64.99	15 1.2	55 1.4	II. N.
23	L	11 41.96	1.798	21 54 51.54	118.04	−14 31 56.8	+795.1	63.87	14 58.0	54 50.0	
24	U	0 3.19	1.741	22 18 7.00	114.65	11 49 24.1	828.8	62.92	14 55.2	54 39.8	
24	L	12 23.81	1.695	22 40 45.41	111.86	9 1 2.8	853.2	62.13	14 52.7	54 30.3	
25	U	0 43.93	1.660	23 2 54.40	109.73	6 8 39.3	869.2	61.52	14 50.4	54 22.0	
25	L	13 3.69	1.635	23 24 41.72	108.26	− 3 13 51.2	+877.4	61.11	14 48.5	54 14.9	
26	U	1 23.23	1.622	23 46 15.23	107.43	− 0 18 9.4	878.3	60.89	14 46.9	54 9.0	I. S.
26	L	13 42.66	1.619	0 7 42.87	107.27	+ 2 37 0.1	872.2	60.86	14 45.6	54 4.5	I. S.
27	U	2 2.13	1.627	0 29 12.45	107.77	5 30 15.4	859.3	61.04	14 44.8	54 1.6	I. S.
27	L	14 21.76	1.646	0 50 51.84	108.92	+ 8 20 16.0	+839.7	61.41	14 44.6	54 0.5	I. S.
28	U	2 41.69	1.676	1 12 48.82	110.70	11 5 40.8	813.3	61.95	14 44.7	54 1.2	I. S.
28	L	15 2.03	1.716	1 35 11.04	113.11	13 45 6.7	779.8	62.68	14 45.5	54 4.0	I. S.
Mar. 1	U	3 22.92	1.767	1 58 5.99	116.14	16 17 6.4	738.8	63.58	14 46.8	54 8.8	I. S.
1	L	15 44.47	1.827	2 21 40.78	119.75	+18 40 6.3	+689.7	64.62	14 48.8	54 16.0	I. S.
2	U	4 6.79	1.895	2 46 1.87	123.85	20 52 25.3	631.9	65.79	14 51.4	54 25.6	I. S.
2	L	16 29.97	1.969	3 11 14.82	128.36	22 52 14.2	564.5	67.04	14 54.7	54 37.8	I. S.
3	U	4 54.08	2.049	3 37 23.70	133.14	24 37 34.7	487.1	68.35	14 58.7	54 52.5	I. S.
3	L	17 19.16	2.130	4 4 30.62	138.01	+26 6 21.3	+398.9	69.64	15 3.4	55 9.8	I. S.
4	U	5 45.19	2.208	4 32 35.11	142.70	27 16 24.1	299.8	70.87	15 8.8	55 29.6	I. S.
4	L	18 12.12	2.279	5 1 33.69	146.97	28 5 34.2	190.2	71.96	15 14.9	55 51.9	I. S.
5	U	6 39.83	2.338	5 31 19.62	150.53	28 31 51.0	+ 71.1	72.86	15 21.6	56 16.5	I. *N*. S.
5	L	19 8.17	2.382	6 1 43.00	153.16	+28 33 29.9	− 55.8	73.50	15 28.9	56 43.1	I. N. *S*.
6	U	7 36.93	2.408	6 32 31.51	154.70	28 9 12.4	187.9	73.86	15 36.6	57 11.4	I. N.
6	L	20 5.88	2.414	7 3 31.42	155.08	27 18 14.0	322.0	73.92	15 44.6	57 40.9	I. N.
7	U	8 34.79	2.402	7 34 29.16	154.36	26 0 29.3	454.9	73.71	15 52.9	58 11.2	I. N.
7	L	21 3.47	2.375	8 5 12.61	152.74	+24 16 34.7	−583.0	73.27	16 1.1	58 41.3	I. N.
8	U	9 31.75	2.337	8 35 32.34	150.46	22 7 47.6	703.1	72.66	16 9.1	59 10.9	I. N.
8	L	21 59.53	2.293	9 5 22.29	147.82	19 36 2.1	812.3	71.96	16 16.8	59 39.1	I. N.
9	U	10 26.78	2.248	9 34 40.05	145.13	16 43 44.6	908.1	71.25	16 23.9	60 5.0	I. N.
9	L	22 53.51	2.208	10 3 26.55	142.66	+13 33 47.7	−988.5	70.59	16 30.1	60 27.8	I. N.

Mar. 5, U Defective Illumination of *N* 0″.55

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Mar. 9	L	22 53.51	2.208	10 3 26.55	142.66	+13 33 47.7	− 988.5	70.59	16 30.1	60 27.8	I. N.
10	U	11 19.79	2.174	10 31 45.62	140.61	10 9 26.2	1052.1	70.04	16 35.3	60 47.0	I. N.
10	L	23 45.71	2.149	10 59 43.49	139.15	6 34 9.8	1097.4	69.65	16 39.3	61 1.7	I. N.*S*.
11	U	12 11.41	2.136	11 27 27.94	138.39	+ 2 51 41.6	1123.9	69.45	16 42.0	61 11.5	*I*. II. *N*. S.
12	L	0 37.03	2.137	11 55 7.94	138.41	− 0 54 7.3	−1130.8	69.46	16 43.2	61 16.0	II. S.
12	U	13 2.74	2.150	12 22 52.96	139.23	4 39 20.7	1118.1	69.68	16 43.0	61 15.2	II. S.
13	L	1 28.69	2.177	12 50 52.38	140.81	8 20 1.6	1085.5	70.11	16 41.4	61 9.4	II. S.
13	U	13 55.03	2.214	13 19 15.05	143.08	11 52 14.9	1033.6	70.73	16 38.5	60 58.6	II. S.
14	L	2 21.87	2.262	13 48 8.59	145.92	−15 12 11.7	− 962.9	71.48	16 34.3	60 43.4	II. S.
14	U	14 49.33	2.315	14 17 38.61	149.12	18 16 13.3	874.5	72.32	16 29.2	60 24.5	II. S.
15	L	3 17.44	2.370	14 47 48.07	152.44	21 0 56.6	770.0	73.19	16 23.2	60 2.5	II. S.
15	U	15 46.19	2.422	15 18 36.40	155.55	23 23 19.7	651.6	73.99	16 16.5	59 38.0	II. S.
16	L	4 15.52	2.464	15 49 59.02	158.10	−25 20 49.3	− 521.8	74.65	16 9.4	59 12.0	II. S.
16	U	16 45.27	2.492	16 21 47.20	159.75	26 51 28.7	383.8	75.09	16 2.1	58 45.1	II. S.
17	L	5 15.24	2.500	16 53 48.47	160.23	27 54 3.9	241.6	75.23	15 54.7	58 17.9	II. S.
17	U	17 45.17	2.485	17 25 47.64	159.38	28 28 8.6	− 99.4	75.03	15 47.4	57 51.0	II. S.
18	L	6 14.80	2.449	17 57 28.45	157.19	−28 34 6.1	+ 39.0	74.49	15 40.2	57 24.8	II. S.
18	U	18 43.86	2.392	18 28 35.41	153.79	28 13 3.8	170.1	73.64	15 33.4	56 59.8	II. N.
19	L	7 12.15	2.320	18 58 55.35	149.40	27 26 46.9	291.0	72.53	15 27.0	56 36.1	II. N.
19	U	19 39.49	2.236	19 28 18.56	144.38	26 17 27.0	400.2	71.23	15 21.0	56 14.1	II. N.
20	L	8 5.79	2.147	19 56 39.16	139.04	−24 47 31.7	+ 496.9	69.82	15 15.4	55 53.7	II. N.
20	U	20 31.01	2.058	20 23 55.12	133.64	22 59 33.7	580.7	68.37	15 10.3	55 35.1	II. N.
21	L	8 55.18	1.972	20 50 7.55	128.47	20 56 4.0	652.3	66.95	15 5.7	55 18.2	II. N.
21	U	21 18.36	1.892	21 15 20.11	123.70	18 39 26.4	712.2	65.62	15 1.6	55 3.2	II. N.
22	L	9 40.63	1.821	21 39 38.28	119.43	−16 11 55.2	+ 761.4	64.41	14 58.0	54 49.7	II. N.
22	U	22 2.10	1.760	22 3 8.74	115.75	13 35 33.2	800.7	63.35	14 54.8	54 38.0	II. N.
23	L	10 22.91	1.710	22 25 58.83	112.72	10 52 14.1	831.0	62.45	14 52.0	54 27.8	II. N.
23	U	22 43.18	1.670	22 48 16.31	110.32	8 3 41.7	853.0	61.73	14 49.6	54 19.1	II. N.
24	L	11 3.03	1.641	23 10 9.05	108.57	− 5 11 31.9	+ 867.3	61.21	14 47.6	54 11.9	II. N..
24	U	23 22.60	1.623	23 31 44.95	107.51	− 2 17 15.6	874.2	60.89	14 46.1	54 6.2	
25	L	11 42.02	1.616	23 53 11.81	107.08	+ 0 37 40.8	874.0	60.75	14 44.8	54 1.5	
26	U	0 1.43	1.619	0 14 37.35	107.28	3 31 53.5	867.0	60.81	14 44.0	53 58.4	
26	L	12 20.93	1.633	0 36 9.15	108.12	+ 6 23 59.1	+ 852.8	61.05	14 43.5	53 56.6	
27	U	0 40.66	1.657	0 57 54.66	109.57	9 12 33.6	831.7	61.47	14 43.3	53 56.1	
27	L	13 0.75	1.691	1 20 1.11	111.61	11 56 10.6	803.2	62.07	14 43.6	53 57.0	
28	U	1 21.29	1.735	1 42 35.47	114.22	14 33 20.2	767.0	62.84	14 44.3	53 59.5	I. S.
28	L	13 42.41	1.788	2 5 44.36	117.34	+17 2 28.2	+ 722.8	63.75	14 45.4	54 3.6	I. S.
29	U	2 4.20	1.847	2 29 33.74	120.96	19 21 53.9	669.9	64.78	14 46.9	54 9.3	I. S.
29	L	14 26.75	1.913	2 54 8.68	124.94	21 29 51.6	608.0	65.91	14 49.0	54 16.7	I. S.
30	U	2 50.12	1.983	3 19 33.09	129.16	23 24 29.4	536.6	67.09	14 51.5	54 26.1	I. S.
30	L	15 14.35	2.055	3 45 49.16	133.50	+25 3 51.2	+ 455.4	68.28	14 54.6	54 37.4	I. S.
31	U	3 39.44	2.126	4 12 56.95	137.77	26 25 59.5	364.3	69.43	14 58.3	54 50.9	I. S.
31	L	16 5.35	2.191	4 40 54.08	141.69	27 28 57.9	263.9	70.49	15 2.5	55 6.4	I. S.
Apr. 1	U	4 32.00	2.248	5 9 35.41	145.08	28 10 57.5	154.7	71.39	15 7.3	55 24.2	I. S.
1	L	16 59.25	2.292	5 38 53.20	147.73	+28 30 22.4	+ 38.4	72.09	15 12.8	55 44.1	I. S.

March 11, U Defective Illumination of *I* 0^s.00 **March 11, U Defective Illumination of** *N* 0″.19

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 1	U	4 32.00	2.248	5 9 35.41	145.08	+28 10 57.5	+ 154.7	71.39	15 7.3	55 24.2	I. S.
1	L	16 59.25	2.292	5 38 53.20	147.73	28 30 22.4	+ 38.4	72.09	15 12.8	55 44.1	I. S.
2	U	5 26.94	2.321	6 8 37.46	149.48	28 25 56.9	− 83.3	72.55	15 18.8	56 6.2	I. S.
2	L	17 54.88	2.333	6 38 36.80	150.24	27 56 50.2	208.1	72.75	15 25.3	56 30.2	I. N.
3	U	6 22.88	2.330	7 8 39.47	150.04	+27 2 41.5	− 333.2	72.70	15 32.4	56 56.0	I. N.
3	L	18 50.75	2.313	7 38 34.61	149.00	25 43 41.2	456.2	72.43	15 39.8	57 23.4	I. N.
4	U	7 18.34	2.285	8 8 13.19	147.33	24 0 30.8	574.5	71.99	15 47.6	57 51.9	I. N.
4	L	19 45.56	2.250	8 37 28.88	145.23	21 54 21.3	685.7	71.43	15 55.6	58 21.2	I. N.
5	U	8 12.34	2.213	9 6 18.35	143.00	+19 26 48.3	− 788.1	70.83	16 3.6	58 50.7	I. N.
5	L	20 38.68	2.178	9 34 41.32	140.86	16 39 50.6	879.5	70.25	16 11.5	59 19.7	I. N.
6	U	9 4.62	2.147	10 2 40.34	139.05	13 35 47.2	958.9	69.75	16 19.1	59 47.4	I. N.
6	L	21 30.25	2.125	10 30 20.34	137.73	10 17 15.0	1024.2	69.37	16 26.1	60 13.2	I. N.
7	U	9 55.67	2.114	10 57 48.20	137.04	+ 6 47 7.9	−1074.3	69.16	16 32.4	60 36.2	I. N.
7	L	22 21.03	2.115	11 25 12.21	137.10	+ 3 8 37.4	1107.9	69.15	16 37.7	60 55.5	I. N.
8	U	10 46.48	2.129	11 52 41.70	137.97	− 0 34 49.1	1123.3	69.35	16 41.8	61 10.7	I. N.
8	L	23 12.18	2.157	12 20 26.47	139.64	4 19 28.1	1119.8	69.77	16 44.6	61 21.0	I. N.S.
9	U	11 38.31	2.198	12 48 36.34	142.13	− 8 1 22.5	−1095.7	70.40	16 46.0	61 26.0	I. *N*.S.
10	L	0 5.00	2.252	13 17 20.49	145.34	11 36 23.6	1050.9	71.22	16 45.9	61 25.6	*I*. II. S.
10	U	12 32.39	2.315	13 46 46.72	149.11	15 0 17.2	984.5	72.18	16 44.2	61 19.5	II. S.
11	L	1 0.57	2.383	14 17 0.59	153.23	18 8 48.8	897.2	73.22	16 41.1	61 8.1	II. S.
11	U	13 29.58	2.452	14 48 4.38	157.37	−20 57 53.7	− 790.3	74.26	16 36.6	60 51.9	II. S.
12	L	1 59.39	2.515	15 19 56.04	161.15	23 23 47.5	665.8	75.21	16 31.0	60 31.5	II. S.
12	U	14 29.88	2.564	15 52 28.50	164.10	25 23 18.9	527.3	75.96	16 24.5	60 7.4	II. S.
13	L	3 0.84	2.593	16 25 29.59	165.83	26 54 3.4	378.9	76.42	16 17.2	59 40.5	II. S.
13	U	15 32.00	2.596	16 58 42.68	166.05	−27 54 34.5	− 226.0	76.51	16 9.4	59 11.8	II. S.
14	L	4 3.04	2.572	17 31 48.39	164.60	28 24 29.7	− 73.8	76.19	16 1.3	58 42.0	II. S.
14	U	16 33.63	2.521	18 4 26.86	161.55	28 24 30.9	+ 72.3	75.47	15 53.0	58 11.8	II. *N*.S.
15	L	5 3.46	2.448	18 36 20.07	157.13	27 56 15.5	208.3	74.41	15 44.9	57 42.0	II. N.S.
15	U	17 32.31	2.358	19 7 13.83	151.70	−27 2 3.5	+ 331.4	73.08	15 37.0	57 13.1	II. N.
16	L	6 0.01	2.258	19 36 58.69	145.70	25 44 41.4	439.8	71.58	15 29.5	56 45.4	II. N.
16	U	18 26.49	2.155	20 5 30.14	139.53	24 7 6.6	533.5	69.99	15 22.4	56 19.6	II. N.
17	L	6 51.74	2.055	20 32 48.01	133.48	22 12 14.9	612.7	68.40	15 16.0	55 55.8	II. N.
17	U	19 15.83	1.961	20 58 55.60	127.85	−20 2 52.6	+ 678.8	66.87	15 10.0	55 34.1	II. N.
18	L	7 38.85	1.876	21 23 58.68	122.78	17 41 31.2	732.9	65.46	15 4.7	55 14.6	II. N.
18	U	20 0.92	1.803	21 48 4.59	118.34	15 10 26.7	776.2	64.21	15 0.0	54 57.4	II. N.
19	L	8 22.17	1.741	22 11 21.62	114.63	12 31 39.6	810.2	63.14	14 56.0	54 42.4	II. N.
19	U	20 42.76	1.692	22 33 58.43	111.64	− 9 46 56.9	+ 835.6	62.25	14 52.5	54 29.9	II. N.
20	L	9 2.82	1.654	22 56 3.85	109.39	6 57 54.8	853.5	61.57	14 49.7	54 19.5	II. N.
20	U	21 22.51	1.629	23 17 46.59	107.86	4 6 0.9	864.3	61.10	14 47.5	54 11.2	II. N.
21	L	9 41.96	1.615	23 39 15.21	107.04	− 1 12 37.3	868.5	60.82	14 45.7	54 4.8	II. N.
21	U	22 1.32	1.613	0 0 38.03	106.90	+ 1 40 56.9	+ 866.1	60.74	14 44.5	54 0.4	II. N.
22	L	10 20.71	1.622	0 22 3.18	107.41	4 33 23.5	857.2	60.87	14 43.8	53 57.6	II. N.
22	U	22 40.28	1.641	0 43 38.53	108.58	7 23 22.8	841.5	61.18	14 43.5	53 56.5	II. N.
23	L	11 0.14	1.671	1 5 31.69	110.38	10 9 32.0	818.8	61.68	14 43.6	53 57.1	
23	U	23 20.42	1.711	1 27 49.99	112.98	+12 50 24.0	+ 788.5	62.35	14 44.2	53 59.1	

April 9, U Defective Illumination of *N* 0″.10

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 23	U	23 20.42	1.711	1 27 49.99	112.78	+12 50 24.0	+ 788.5	62.35	14 44.2	53 59.1	
24	L	11 41.23	1.759	1 50 40.29	115.70	15 24 25.4	750.2	63.17	14 45.1	54 2.5	
25	U	0 2.67	1.816	2 14 8.83	119.13	17 49 55.7	703.3	64.13	14 46.4	54 7.3	
25	L	12 24.84	1.880	2 38 21.04	122.97	20 5 8.2	647.2	65.19	14 48.0	54 13.3	
26	U	0 47.81	1.948	3 3 21.04	127.07	+22 8 9.2	+ 581.3	66.32	14 50.1	54 20.7	
26	L	13 11.61	2.019	3 29 11.40	131.32	23 57 0.5	505.4	67.48	14 52.5	54 29.5	I. S.
27	U	1 36.26	2.088	3 55 52.52	135.51	25 29 41.3	419.6	68.61	14 55.2	54 39.5	I. S.
27	L	14 1.71	2.153	4 23 22.42	139.41	26 44 13.5	324.1	69.65	14 58.3	54 51.0	I. S.
28	U	2 27.90	2.210	4 51 36.33	142.80	+27 38 46.1	+ 219.9	70.56	15 1.8	55 3.8	I. S.
28	L	14 54.70	2.254	5 20 26.75	145.46	28 11 42.2	+ 108.4	71.28	15 5.7	55 18.1	I. S.
29	U	3 21.94	2.283	5 49 43.91	147.23	28 21 45.0	− 8.6	71.76	15 10.0	55 33.9	I. S.
29	L	15 49.43	2.296	6 19 16.41	148.02	28 8 3.7	128.6	71.99	15 14.7	55 51.2	I. S.
30	U	4 16.99	2.293	6 48 52.31	147.81	+27 30 16.5	− 249.1	71.97	15 19.8	56 10.0	I. N.
30	L	16 44.41	2.275	7 18 20.34	146.73	26 28 32.7	367.7	71.73	15 25.4	56 30.3	I. N.
May 1	U	5 11.54	2.245	7 47 30.92	144.96	25 3 30.4	481.8	71.30	15 31.3	56 52.0	I. N.
1	L	17 38.26	2.208	8 16 17.02	142.69	23 16 13.3	589.8	70.73	15 37.5	57 14.9	I. N.
2	U	6 4.51	2.167	8 44 34.56	140.22	+21 8 6.3	− 689.9	70.10	15 44.0	57 38.8	I. N.
2	L	18 30.27	2.127	9 12 22.52	137.81	18 40 51.4	781.0	69.47	15 50.8	58 3.5	I. N.
3	U	6 55.56	2.091	9 39 42.77	135.64	15 56 23.0	862.0	68.89	15 57.6	58 28.7	I. N.
3	L	19 20.47	2.062	10 6 39.63	133.94	12 56 46.0	932.4	68.43	16 4.5	58 54.0	I. N.
4	U	7 45.10	2.044	10 33 19.51	132.82	+ 9 44 16.3	− 990.7	68.12	16 11.3	59 18.7	I. N.
4	L	20 9.58	2.038	10 59 50.43	132.46	6 21 19.7	1036.5	68.00	16 17.7	59 42.2	I. N.
5	U	8 34.06	2.045	11 26 21.62	132.89	+ 2 50 34.3	1068.6	68.08	16 23.6	60 4.1	I. N.
5	L	20 58.71	2.066	11 53 3.23	134.19	− 0 45 7.1	1085.6	68.40	16 29.0	60 23.7	I. N.
6	U	9 23.72	2.103	12 20 5.84	136.39	− 4 22 35.3	−1086.2	68.95	16 33.5	60 40.2	I. N.
6	L	21 49.25	2.154	12 47 40.14	139.47	7 58 23.0	1068.6	69.72	16 37.0	60 53.0	I. N.
7	U	10 15.47	2.219	13 15 56.31	143.35	11 28 44.2	1031.6	70.69	16 39.3	61 1.6	I. N.
7	L	22 42.54	2.295	13 45 3.34	147.91	14 49 36.7	973.7	71.83	16 40.4	61 5.5	I. N.*S*.
8	U	11 10.57	2.378	14 15 8.04	152.91	−17 56 45.8	− 894.2	73.06	16 40.1	61 4.5	I. *N*.S.
8	L	23 39.62	2.463	14 46 13.80	158.03	20 45 52.4	793.4	74.31	16 38.4	60 58.5	I. S.
9	U	12 9.66	2.543	15 18 19.41	162.81	23 12 46.2	672.4	75.48	16 35.5	60 47.7	II. S.
10	L	0 40.58	2.608	15 51 17.95	166.75	25 13 41.4	534.2	76.44	16 31.3	60 32.2	II. S.
10	U	13 12.16	2.651	16 24 56.27	169.36	−26 45 35.0	− 383.0	77.08	16 25.9	60 12.5	II. S.
11	L	1 44.09	2.665	16 58 55.62	170.21	27 46 24.6	224.6	77.30	16 19.6	59 49.3	II. S.
11	U	14 16.00	2.647	17 32 53.46	169.09	28 15 21.9	− 65.4	77.06	16 12.5	59 23.4	II. S.
12	L	2 47.48	2.596	18 6 26.14	166.04	28 12 56.0	+ 88.3	76.37	16 4.9	58 55.4	II. S.
12	U	15 18.19	2.518	18 39 12.08	161.36	−27 40 46.7	+ 231.1	75.27	15 57.0	58 26.3	II. *N*.S.
13	L	3 47.84	2.420	19 10 54.10	155.47	26 41 28.1	359.4	73.86	15 48.9	57 56.7	II. N.*S*.
13	U	16 16.24	2.311	19 41 20.83	148.89	25 18 8.9	471.0	72.25	15 40.9	57 27.4	II. N.
14	L	4 43.29	2.198	20 10 26.91	142.11	23 34 11.7	565.7	70.55	15 33.1	56 58.9	II. N.
14	U	17 9.01	2.088	20 38 12.16	135.50	−21 32 57.4	+ 644.1	68.85	15 25.7	56 31.7	II. N.
15	L	5 33.44	1.986	21 4 40.49	129.34	19 17 32.9	707.6	67.23	15 18.8	56 6.3	II. N.
15	U	17 56.71	1.894	21 29 58.61	123.81	16 50 46.8	758.0	65.74	15 12.4	55 42.9	II. N.
16	L	6 18.95	1.815	21 54 14.96	119.05	14 15 6.5	797.0	64.42	15 6.7	55 21.7	II. N.
16	U	18 40.32	1.749	22 17 38.88	115.08	−11 32 39.7	+ 826.0	63.30	15 1.6	55 3.0	II. N.

May 8, U Defective Illumination of *N* 0″.17 **May 12, U Defective Illumination of *N* 0″.06**

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 16	U	18 40.32	1.749	22 17 38.88	115.08	−11 32 39.7	+ 826.0	63.30	15 1.6	55 3.0	II. N.
17	L	7 0.98	1.697	22 40 20.12	111.94	8 45 16.0	846.6	62.40	14 57.2	54 46.8	II. N.
17	U	19 21.09	1.658	23 2 28.41	109.59	5 54 31.2	859.7	61.71	14 53.5	54 33.2	II. N.
18	L	7 40.81	1.632	23 24 13.32	108.03	3 1 50.5	866.0	61.23	14 50.5	54 22.2	II. N.
18	U	20 0.30	1.619	23 45 44.16	107.23	− 0 8 31.6	+ 866.2	60.97	14 48.1	54 13.7	II. N.
19	L	8 19.71	1.618	0 7 10.00	107.18	+ 2 44 12.2	860.1	60.93	14 46.5	54 7.7	II. N.
19	U	20 39.18	1.629	0 28 39.59	107.86	5 35 7.7	848.1	61.09	14 45.5	54 4.0	II. N.
20	L	8 58.85	1.652	0 50 21.39	109.22	8 23 1.0	829.7	61.45	14 45.1	54 2.5	II. N.
20	U	21 18.86	1.685	1 12 23.53	111.26	+11 6 33.6	+ 804.6	62.01	14 45.3	54 3.1	II. N.
21	L	9 39.33	1.729	1 34 53.84	113.91	13 44 20.9	772.0	62.73	14 46.0	54 5.8	II. N.
21	U	22 0.40	1.783	1 57 59.55	117.14	16 14 50.6	731.4	63.61	14 47.2	54 10.1	II. N.
22	L	10 22.16	1.845	2 21 47.17	120.87	18 36 21.0	682.0	64.62	14 48.8	54 16.0	II. N.
22	U	22 44.71	1.914	2 46 22.11	125.02	+20 47 1.7	+ 623.1	65.72	14 50.8	54 23.5	II. N.
23	L	11 8.11	1.987	3 11 48.30	129.39	22 44 54.1	553.9	66.89	14 53.2	54 32.3	
23	U	23 32.40	2.061	3 38 7.73	133.84	24 27 53.3	474.1	68.06	14 55.9	54 42.3	
24	L	11 57.56	2.132	4 5 19.77	138.13	25 53 52.5	383.9	69.18	14 59.0	54 53.4	
25	U	0 23.54	2.196	4 33 20.96	141.98	+27 0 48.5	+ 284.0	70.18	15 2.2	55 5.4	
25	L	12 50.22	2.249	5 2 4.70	145.17	27 46 48.7	175.0	71.00	15 5.7	55 18.3	
26	U	1 17.45	2.287	5 31 21.41	147.45	28 10 19.4	+ 59.2	71.60	15 9.5	55 32.0	I. S.
26	L	13 45.04	2.307	6 0 59.25	148.66	28 10 13.6	− 60.7	71.93	15 13.4	55 46.4	I. S.
27	U	2 12.75	2.309	6 30 44.99	148.76	+27 45 56.0	− 182.2	71.98	15 17.5	56 1.5	I. S.
27	L	14 40.38	2.293	7 0 25.52	147.81	26 57 26.8	302.2	71.78	15 21.8	56 17.3	I. N.
28	U	3 7.73	2.262	7 29 48.98	145.96	25 45 20.5	418.0	71.34	15 26.3	56 33.6	I. N.
28	L	15 34.63	2.220	7 58 46.03	143.46	24 10 42.1	527.2	70.74	15 30.9	56 50.6	I. N.
29	U	4 0.99	2.172	8 27 10.35	140.56	+22 15 1.7	− 628.1	70.02	15 35.6	57 8.0	I. N.
29	L	16 26.76	2.122	8 54 59.07	137.56	20 0 7.2	719.4	69.27	15 40.5	57 25.9	I. N.
30	U	4 51.95	2.075	9 22 12.48	134.71	17 27 58.7	800.3	68.55	15 45.5	57 44.2	I. N.
30	L	17 16.60	2.034	9 48 53.73	132.23	14 40 43.4	870.4	67.92	15 50.6	58 2.8	I. N.
31	U	5 40.80	2.002	10 15 8.33	130.30	+11 40 33.4	− 929.4	67.41	15 55.7	58 21.5	I. N.
31	L	18 4.69	1.981	10 41 3.69	129.05	8 29 43.4	976.9	67.08	16 0.7	58 40.0	I. N.
June 1	U	6 28.40	1.973	11 6 48.59	128.57	5 10 32.3	1012.8	66.95	16 5.7	58 58.2	I. N.
1	L	18 52.10	1.980	11 32 32.88	128.95	+ 1 45 24.6	1036.3	67.04	16 10.4	59 15.6	I. N.
2	U	7 15.97	2.001	11 58 27.14	130.24	− 1 43 7.3	−1046.7	67.37	16 14.9	59 32.0	I. N.
2	L	19 40.19	2.038	12 24 42.42	132.46	5 12 19.6	1042.8	67.94	16 18.9	59 46.8	I. N.
3	U	8 4.94	2.090	12 51 29.83	135.60	8 39 14.3	1023.6	68.74	16 22.4	59 59.6	I. N.
3	L	20 30.40	2.156	13 19 0.14	139.59	12 0 36.9	987.3	69.75	16 25.2	60 10.0	I. N.
4	U	8 56.74	2.235	13 47 23.07	144.34	−15 12 56.3	− 932.7	70.95	16 27.3	60 17.5	I. N.
4	L	21 24.08	2.323	14 16 46.45	149.63	18 12 24.8	858.7	72.26	16 28.5	60 21.8	I. N.
5	U	9 52.51	2.415	14 47 15.12	155.15	20 55 3.6	764.5	73.60	16 28.6	60 22.4	I. N.
5	L	22 22.03	2.504	15 18 49.49	160.51	23 16 52.8	650.5	74.88	16 27.7	60 19.2	I. N.S.
6	U	10 52.56	2.581	15 51 24.38	165.16	−25 14 4.9	− 518.7	75.99	16 25.8	60 12.1	I. *N*.S.
6	L	23 23.00	2.638	16 24 48.25	168.56	26 43 23.3	372.3	76.79	16 22.8	60 1.1	I. S.
7	U	11 55.76	2.666	16 58 43.28	170.27	27 42 22.6	216.4	77.19	16 18.8	59 46.5	I. *II*. S.
8	L	0 27.76	2.661	17 32 46.97	169.97	28 9 46.8	− 57.5	77.12	16 13.9	59 28.5	II. S.
8	U	12 59.50	2.622	18 6 34.62	167.62	−28 5 36.8	+ 98.1	76.58	16 8.3	59 7.7	II. S.

June 6, U Defective Illumination of *N* 0″.76

June 7, U Defective Illumination of *II* 0″.00

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
June 8	U	12 59.50	2.622	18 6 34.62	167.62	−28 5 36.8	+ 98.1	76.58	16 8.3	59 7.7	II. S.
9	L	1 30.58	2.553	18 39 42.73	163.43	27 31 10.8	244.2	75.59	16 1.9	58 44.5	II. *N*. S.
9	U	14 0.67	2.460	19 11 51.71	157.85	26 28 51.0	376.4	74.26	15 55.2	58 19.7	II. *N*. S.
10	L	2 29.56	2.352	19 42 47.79	151.38	25 1 43.4	491.9	72.69	15 48.1	57 53.8	II. N. *S*.
10	U	14 57.11	2.239	20 12 23.51	144.55	−23 13 17.8	+ 589.5	71.00	15 40.9	57 27.5	II. N.
11	L	3 23.29	2.126	20 40 37.22	137.79	21 7 6.5	669.5	69.29	15 33.8	57 1.3	II. N.
11	U	15 48.16	2.020	21 7 31.85	131.41	18 46 32.5	733.5	67.65	15 26.9	56 35.8	II. N.
12	L	4 11.82	1.925	21 33 13.62	125.67	16 14 39.6	783.0	66.13	15 20.2	56 11.5	II. N.
12	U	16 34.41	1.842	21 57 50.83	120.67	−13 34 10.1	+ 820.0	64.79	15 14.1	55 48.8	II. N.
13	L	4 56.08	1.772	22 21 32.89	116.50	10 47 23.6	846.2	63.65	15 8.4	55 27.9	II. N.
13	U	17 17.00	1.717	22 44 29.81	113.13	7 56 19.7	863.0	62.72	15 3.3	55 9.3	II. N.
14	L	5 37.34	1.675	23 6 51.67	110.64	5 2 41.0	872.1	62.01	14 58.9	54 53.1	II. N.
14	U	17 57.26	1.647	23 28 48.42	108.96	− 2 7 56.9	+ 874.1	61.52	14 55.1	54 39.3	II. N.
15	L	6 16.92	1.632	23 50 29.74	108.07	+ 0 46 33.7	869.9	61.26	14 52.1	54 28.2	II. N.
15	U	18 36.48	1.629	0 12 5.10	107.96	3 39 37.3	859.7	61.22	14 49.8	54 19.8	II. N.
16	L	6 56.10	1.641	0 33 43.70	108.60	6 30 3.3	843.6	61.39	14 48.2	54 14.1	II. N.
16	U	19 15.92	1.664	0 55 34.44	109.97	+ 9 16 40.6	+ 821.6	61.77	14 47.4	54 11.0	II. N.
17	L	7 36.09	1.699	1 17 45.91	112.07	11 58 14.8	793.0	62.35	14 47.3	54 10.6	II. N.
17	U	19 56.74	1.744	1 40 26.36	114.79	14 33 25.3	757.5	63.11	14 47.9	54 12.7	II. N.
18	L	8 17.99	1.800	2 3 43.50	118.15	17 0 43.7	714.2	64.01	14 49.0	54 17.0	II. N.
18	U	20 39.97	1.865	2 27 44.28	122.05	+19 18 31.5	+ 662.2	65.06	14 50.8	54 23.6	II. N.
19	L	9 2.78	1.937	2 52 34.52	126.38	21 24 59.8	600.8	66.21	14 53.2	54 32.3	II. N.
19	U	21 26.47	2.012	3 18 18.46	130.98	23 18 9.9	529.1	67.41	14 56.0	54 42.6	II. N.
20	L	9 51.09	2.091	3 44 58.16	135.64	24 55 55.3	446.7	68.60	14 59.3	54 54.6	II. N.
20	U	22 16.63	2.165	4 12 32.97	140.11	+26 16 5.6	+ 353.3	69.74	15 2.9	55 8.0	II. S.
21	L	10 43.02	2.232	4 40 58.98	144.14	27 16 33.2	249.7	70.75	15 6.9	55 22.4	II. S.
21	U	23 10.14	2.286	5 10 8.90	147.41	27 55 21.6	137.0	71.56	15 11.1	55 37.8	
22	L	11 37.82	2.323	5 39 52.19	149.64	28 10 54.2	+ 17.4	72.11	15 15.4	55 53.7	
23	U	0 5.83	2.342	6 9 55.75	150.73	+28 2 3.7	− 106.3	72.38	15 19.8	56 10.0	
23	L	12 33.94	2.340	6 40 5.22	150.62	27 28 19.6	231.0	72.36	15 24.3	56 26.4	
24	U	1 1.91	2.319	7 10 6.32	149.36	26 29 50.3	353.3	72.06	15 28.8	56 42.8	
24	L	13 29.53	2.282	7 39 46.44	147.17	25 7 23.9	469.9	71.52	15 33.2	56 59.0	I. S.
25	U	1 56.64	2.234	8 8 55.77	144.30	+23 22 23.3	− 578.6	70.82	15 37.5	57 14.8	I. N.
25	L	14 23.13	2.180	8 37 27.89	141.04	21 16 38.2	677.1	70.01	15 41.7	57 30.1	I. N.
26	U	2 48.96	2.125	9 5 20.11	137.69	18 52 18.1	764.3	69.18	15 45.7	57 44.8	I. N.
26	L	15 14.14	2.072	9 32 33.04	134.52	16 11 44.3	839.4	68.39	15 49.5	57 58.8	I. N.
27	U	3 38.72	2.026	9 59 10.29	131.76	+13 17 24.7	− 901.8	67.68	15 53.1	58 12.2	I. N.
27	L	16 2.81	1.990	10 25 17.78	129.58	10 11 48.9	952.0	67.13	15 56.6	58 24.8	I. N.
28	U	4 26.53	1.966	10 51 3.24	128.11	6 57 26.5	989.7	66.76	15 59.9	58 36.8	I. N.
28	L	16 50.03	1.954	11 16 35.67	127.43	3 36 46.5	1014.8	66.60	16 2.9	58 47.9	I. N.
29	U	5 13.49	1.957	11 42 5.04	127.61	+ 0 12 19.0	−1027.6	66.66	16 5.6	58 58.0	I. N.
29	L	17 37.07	1.975	12 7 41.95	128.69	− 3 13 23.7	1027.4	66.95	16 8.1	59 7.3	I. N.
30	U	6 0.95	2.008	12 33 37.26	130.68	6 37 44.0	1013.7	67.49	16 10.4	59 15.5	I. N.
30	L	18 25.32	2.056	13 0 1.84	133.56	9 57 56.3	985.9	68.25	16 12.3	59 22.4	I. N.
July 1	U	6 50.35	2.118	13 27 6.16	137.29	−13 11 4.9	− 942.8	69.22	16 13.8	59 28.0	I. N.

June 9, U Defective Illumination of *N* 0″.10

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 1	U	6 50.35	2.118	13 27 6.16	137.29	−13 11 4.9	−942.8	69.22	16 13.8	59 28.0	I. N.
1	L	19 16.20	2.192	13 54 59.68	141.74	16 14 1.9	883.8	70.36	16 14.9	59 32.0	I. N.
2	U	7 43.00	2.275	14 23 50.07	146.73	19 3 28.2	807.6	71.60	16 15.4	59 34.1	I. N.
2	L	20 10.82	2.362	14 53 42.19	151.97	21 35 56.1	714.1	72.89	16 15.4	59 34.1	I. N.
3	U	8 39.68	2.447	15 24 37.03	157.10	−23 47 55.0	−603.0	74.13	16 14.8	59 31.9	I. N.
3	L	21 9.52	2.523	15 56 30.38	161.65	25 36 5.0	476.1	75.21	16 13.7	59 27.5	I. N.
4	U	9 40.16	2.581	16 29 12.31	165.12	26 57 29.0	335.9	76.02	16 11.8	59 20.5	I. N. *S.*
4	L	22 11.35	2.613	17 2 27.13	167.07	27 49 52.1	186.8	76.46	16 9.2	59 11.0	I. *N.* S.
5	U	10 42.75	2.615	17 35 54.53	167.18	−28 11 56.3	− 33.8	76.46	16 5.9	58 59.0	I. S.
5	L	23 13.98	2.585	18 9 11.87	165.39	28 3 32.1	+117.0	76.01	16 2.0	58 44.7	I. S.
6	U	11 44.68	2.526	18 41 56.89	161.84	27 25 38.9	260.1	75.15	15 57.5	58 28.2	I. S.
7	L	0 14.52	2.444	19 13 50.52	156.89	26 20 18.4	391.0	73.94	15 52.4	58 9.7	*I.* II. S.
7	U	12 43.27	2.346	19 44 38.67	151.01	−24 50 18.3	+506.4	72.49	15 47.0	57 49.8	II. *N.* S.
8	L	1 10.80	2.241	20 14 12.95	144.66	22 58 53.6	604.9	70.90	15 41.3	57 28.9	II. N. *S.*
8	U	13 37.05	2.135	20 42 30.46	138.28	20 49 29.4	686.2	69.28	15 35.4	57 7.3	II. N. *S.*
9	L	2 2.05	2.033	21 9 32.85	132.20	18 25 27.0	751.4	67.71	15 29.5	56 45.4	II. N.
9	U	14 25.88	1.941	21 35 25.13	126.63	−15 49 53.9	+801.6	66.25	15 23.6	56 23.8	II. N.
10	L	2 48.67	1.860	22 0 14.58	121.74	13 5 39.4	838.7	64.95	15 17.9	56 2.8	II. N.
10	U	15 10.56	1.791	22 24 9.87	117.60	10 15 11.7	864.1	63.84	15 12.5	55 43.0	II. N.
11	L	3 31.71	1.736	22 47 20.35	114.27	7 20 40.5	879.5	62.93	15 7.4	55 24.4	II. N.
11	U	15 52.27	1.694	23 9 55.64	111.74	− 4 23 57.6	+886.3	62.24	15 2.8	55 7.6	II. N.
12	L	4 12.40	1.665	23 32 5.37	110.01	− 1 26 39.9	885.5	61.77	14 58.8	54 52.8	II. N.
12	U	16 32.27	1.649	23 53 59.03	109.07	+ 1 29 46.0	877.8	61.52	14 55.4	54 40.2	II. N.
13	L	4 52.03	1.646	0 15 45.89	108.89	4 24 2.1	863.9	61.49	14 52.6	54 30.0	II. N.
13	U	17 11.82	1.655	0 37 35.04	109.45	+ 7 14 55.0	+843.9	61.66	14 50.5	54 22.3	II. N.
14	L	5 31.80	1.677	0 59 35.35	110.74	10 1 12.6	817.9	62.04	14 49.1	54 17.3	II. N.
14	U	17 52.11	1.710	1 21 55.37	112.73	12 41 40.6	785.7	62.62	14 48.5	54 15.1	II. N.
15	L	6 12.88	1.754	1 44 43.40	115.39	15 15 1.4	746.6	63.37	14 48.6	54 15.5	II. N.
15	U	18 34.25	1.809	2 8 7.21	118.68	+17 39 50.1	+700.2	64.29	14 49.5	54 18.7	II. N.
16	L	6 56.33	1.873	2 32 13.85	122.52	19 54 33.0	645.4	65.34	14 51.1	54 24.6	II. N.
16	U	19 19.22	1.944	2 57 9.37	126.81	21 57 26.4	581.8	66.48	14 53.4	54 33.0	II. N.
17	L	7 43.00	2.020	3 22 58.28	131.38	23 46 37.1	508.3	67.68	14 56.3	54 43.8	II. N.
17	U	20 7.70	2.098	3 49 42.96	136.06	+25 20 3.4	+424.2	68.88	14 59.9	54 56.9	II. N.
18	L	8 33.33	2.173	4 17 23.19	140.59	26 35 38.3	329.7	70.03	15 4.1	55 12.1	II. N.
18	U	20 59.83	2.241	4 45 55.58	144.71	27 31 16.0	224.9	71.05	15 8.6	55 28.9	II. N.
19	L	9 27.08	2.298	5 15 13.26	148.10	28 4 59.4	+110.8	71.88	15 13.6	55 47.2	II. S.
19	U	21 54.91	2.338	5 45 6.12	150.54	+28 15 9.4	− 10.3	72.45	15 18.9	56 6.5	II. S.
20	L	10 23.12	2.360	6 15 21.44	151.81	28 0 34.2	136.1	72.75	15 24.4	56 26.6	II. S.
20	U	22 51.46	2.361	6 45 44.89	151.89	27 20 37.8	263.2	72.74	15 29.9	56 47.0	II. S.
21	L	11 19.70	2.343	7 16 2.24	150.82	26 15 24.7	388.3	72.45	15 35.4	57 7.3	
21	U	23 47.62	2.309	7 46 0.64	148.77	+24 45 39.8	−507.9	71.92	15 40.8	57 27.1	
22	L	12 15.07	2.263	8 15 29.95	146.01	22 52 46.9	619.2	71.23	15 46.0	57 46.2	
23	U	0 41.91	2.211	8 44 23.41	142.86	20 38 41.2	719.8	70.44	15 50.9	58 4.0	
23	L	13 8.11	2.156	9 12 37.91	139.58	18 5 41.6	807.9	69.61	15 55.4	58 20.4	I. N.
24	U	1 33.67	2.104	9 40 13.80	136.45	+15 16 24.1	−882.6	68.82	15 59.4	58 35.0	I. N.

July 4, U Defective Illumination of *S* 0″.03

July 7, U Defective Illumination of *N* 0″.92

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 24	U	1 33.67	2.104	9 40 13.80	136.45	+15 16 24.1	− 882.6	68.82	15 59.4	58 35.0	I. N.
24	L	13 58.64	2.059	10 7 14.37	133.71	12 13 33.9	943.3	68.12	16 2.8	58 47.7	I. N.
25	U	2 23.11	2.023	10 33 45.29	131.53	9 0 0.8	989.8	67.56	16 5.7	58 58.4	I. N.
25	L	14 47.22	1.998	10 59 54.07	130.04	5 38 36.6	1021.9	67.20	16 8.1	59 7.2	I. N.
26	U	3 11.11	1.986	11 25 49.45	129.32	+ 2 12 11.9	−1039.8	67.03	16 9.9	59 13.9	I. N.
26	L	15 34.93	1.988	11 51 41.08	129.43	− 1 16 23.1	1043.6	67.09	16 11.2	59 18.6	I. N.
27	U	3 58.86	2.004	12 17 39.16	130.39	4 44 19.1	1033.2	67.38	16 12.0	59 21.5	I. N.
27	L	16 23.07	2.034	12 43 53.97	132.22	8 8 45.7	1008.6	67.88	16 12,3	59 22.7	I. N.
28	U	4 47.73	2.078	13 10 35.68	134.88	−11 26 49.6	− 969.5	68.61	16 12.2	59 22.2	I. N.
28	L	17 12.99	2.134	13 37 53.75	138.28	14 35 34.5	915.5	69.51	16 11.7	59 20.3	I. N.
29	U	5 38.99	2.201	14 5 56.45	142.28	17 31 59.3	846.0	70.56	16 10.8	59 16.9	I. N.
29	L	18 5.84	2.275	14 34 50.07	146.71	20 12 58.8	761.2	71.69	16 9.5	59 12.2	I. N.
30	U	6 33.60	2.351	15 4 38.07	151.28	−22 35 28.1	− 661.1	72.82	16 7.9	59 6.4	I. N.
30	L	19 2.25	2.423	15 35 20.06	155.64	24 36 26.8	546.4	73.89	16 6.0	58 59.3	I. N.
31	U	7 31.71	2.485	16 6 51.05	159.37	26 13 9.1	418.6	74.79	16 3.7	58 51.0	I. N.
31	L	20 1.82	2.530	16 39 1.03	162.07	27 23 14.9	280.9	75.42	16 1.2	58 41.7	I. N.
Aug. 1	U	8 32.34	2.552	17 11 35.31	163.38	−28 5 4.1	− 136.6	75.70	15 58.3	58 31.1	I. *N.*S.
1	L	21 2.96	2.547	17 44 15.72	163.07	28 17 46.7	+ 9.4	75.59	15 55.1	58 19.3	I. *N.*S.
2	U	9 33.35	2.514	18 16 42.53	161.12	28 1 30.0	152.5	75.08	15 51.6	58 6.5	I. S.
2	L	22 3.20	2.457	18 48 36.82	157.69	27 17 18.3	287.9	74.21	15 47.8	57 52.7	I. S.
3	U	10 32.25	2.381	19 19 42.55	153.09	−26 7 6.2	+ 411.9	73.05	15 43.8	57 37.8	I. S.
3	L	23 0.29	2.292	19 49 48.00	147.71	24 33 26.3	522.2	71.69	15 39.5	57 22.2	I. S.
4	U	11 27.22	2.196	20 18 46.26	141.97	22 39 14.7	617.0	70.21	15 35.0	57 5.6	I. S.
4	L	23 52.99	2.100	20 46 35.00	136.18	20 27 37.5	696.4	68.71	15 30.4	56 48.7	I. S.
5	U	12 17.63	2.008	21 13 15.78	130.68	−18 1 39.8	+ 760.7	67.25	15 25.7	56 31.4	*I.* II. *N.*S.
6	L	0 41.21	1.924	21 38 53.06	125.64	15 24 17.4	810.7	65.91	15 20.9	56 13.9	II. N.*S.*
6	U	13 3.85	1.850	22 3 33.35	121.19	12 38 12.7	847.9	64.71	15 16.2	55 56.7	II. N.
7	L	1 25.67	1.788	22 27 24.39	117.43	9 45 52.5	873.6	63.68	15 11.6	55 39.9	II. N.
7	U	13 46.81	1.738	22 50 34.65	114.41	− 6 49 27.4	+ 888.9	62.85	15 7.3	55 23.8	II. N.
8	L	2 7.42	1.699	23 13 12.90	112.11	3 50 53.8	895.2	62.23	15 3.2	55 8.8	II. N.
8	U	14 27.65	1.673	23 35 27.98	110.54	− 0 51 55.4	893.3	61.81	14 59.4	54 55.0	II. N.
9	L	2 47.63	1.660	23 57 28.68	109.70	+ 2 5 54.5	883.8	61.60	14 56.1	54 42.8	II. N.
9	U	15 7.52	1.658	0 19 23.63	109.59	+ 5 1 10.6	+ 867.6	61.60	14 53.2	54 32.3	II. N.
10	L	3 27.46	1.667	0 41 21.30	110.17	7 52 33.0	844.9	61.79	14 50.9	54 23.9	II. N.
10	U	15 47.58	1.688	1 3 29.95	111.42	10 38 44.1	815.8	62.18	14 49.2	54 17.6	II. N.
11	L	4 8.01	1.720	1 25 57.64	113.34	13 18 26.5	780.1	62.76	14 48.1	54 13.7	II. N.
11	U	16 28.89	1.762	1 48 52.03	115.86	+15 50 20.6	+ 737.7	63.50	14 47.8	54 12.4	II. N.
12	L	4 50.33	1.813	2 12 20.39	118.97	18 13 1.8	687.9	64.39	14 48.1	54 13.7	II. N.
12	U	17 12.45	1.873	2 36 29.26	122.58	20 24 59.9	630.4	65.41	14 49.2	54 17.7	II. N.
13	L	5 35.33	1.941	3 1 24.21	126.63	22 24 36.6	564.2	66.52	14 51.1	54 24.5	II. N.
13	U	17 59.04	2.013	3 27 9.37	130.93	+24 10 6.3	+ 489.0	67.68	14 53.7	54 34.0	II. N.
14	L	6 23.63	2.086	3 53 46.99	135.34	25 39 36.6	404.3	68.84	14 57.0	54 46.2	II. N.
14	U	18 49.09	2.157	4 21 16.97	139.61	26 51 10.8	309.8	69.93	15 1.0	55 1.0	II. N.
15	L	7 15.37	2.222	4 49 36.34	143.53	27 42 53.8	205.8	70.93	15 5.7	55 18.3	II. N.
15	U	19 42.37	2.276	5 18 39.16	146.81	+28 12 56.9	+ 93.4	71.74	15 11.0	55 37.7	II. N.

Aug. 1, U Defective Illumination of *N* 0″.00
Aug. 5, U Defective Illumination of *I* 0″.06
Aug. 5, U Defective Illumination of *N* 0″.35

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 15	U	19 42.37	2.276	5 18 39.16	146.81	+28 12 56.9	+ 93.4	71.74	15 11.0	55 37.7	II. N.
16	L	8 9.95	2.317	5 48 16.51	149.26	28 19 46.8	− 26.1	72.32	15 16.9	55 59.1	II. S.
16	U	20 37.91	2.341	6 18 17.14	150.67	28 2 12.0	150.2	72.64	15 23.1	56 22.1	II. S.
17	L	9 6.05	2.346	6 48 28.42	151.02	27 19 32.7	276.3	72.69	15 29.7	56 46.3	II. S
17	U	21 34.15	2.335	7 18 37.56	150.33	+26 11 43.8	− 401.3	72.49	15 36.5	57 11.2	II. S
18	L	10 2.03	2.309	7 48 32.90	148.75	24 39 17.9	522.1	72.05	15 43.3	57 36.2	II. S
18	U	22 29.52	2.272	8 18 5.10	146.51	22 43 23.6	635.5	71.46	15 50.0	58 0.9	II. S.
19	L	10 56.52	2.228	8 47 7.73	143.88	20 25 42.7	739.4	70.77	15 56.5	58 24.7	II. S.
19	U	23 22.97	2.182	9 15 37.70	141.12	+17 48 24.1	− 831.5	70.05	16 2.6	58 47.0	
20	L	11 48.89	2.138	9 43 35.08	138.49	14 53 58.5	910.3	69.36	16 8.2	59 7.3	
21	U	0 14.31	2.100	10 11 2.76	136.20	11 45 13.4	974.7	68.76	16 13.0	59 25.1	
21	L	12 39.32	2.071	10 38 5.94	134.43	8 25 7.5	1023.6	68.30	16 17.0	59 39.8	
22	U	1 4.04	2.052	11 4 51.62	133.30	+ 4 56 47.6	−1056.9	68.02	16 20.2	59 51.4	I. N.
22	L	13 28.61	2.045	11 31 28.10	132.91	+ 1 23 26.2	1073.8	67.93	16 22.4	59 59.7	I. N.
23	U	1 53.18	2.052	11 58 4.48	133.30	− 2 11 41.0	1074.5	68.06	16 23.7	60 4.5	I. N.
23	L	14 17.91	2.072	12 24 50.39	134.48	5 45 16.5	1058.6	68.40	16 24.1	60 5.8	I. N.
24	U	2 42.95	2.105	12 51 55.40	136.47	− 9 14 2.1	−1026.1	68.95	16 23.6	60 3.9	I. N.
24	L	15 8.46	2.150	13 19 28.64	139.19	12 34 38.3	977.1	69.69	16 22.4	59 59.2	I. N.
25	U	3 34.58	2.205	13 47 38.25	142.51	15 43 47.5	911.6	70.58	16 20.3	59 51.7	I. N.
25	L	16 1.41	2.268	14 16 30.78	146.29	18 38 13.5	830.0	71.57	16 17.6	59 41.9	I. N.
26	U	4 29.02	2.334	14 46 10.26	150.29	−21 14 46.0	− 732.9	72.60	16 14.4	59 30.1	I. N.
26	L	16 57.43	2.399	15 16 37.49	154.19	23 30 24.7	621.2	73.59	16 10.7	59 16.8	I. N.
27	U	5 26.57	2.456	15 47 49.27	157.65	25 22 26.1	497.0	74.45	16 6.8	59 2.3	I. N.
27	L	17 56.33	2.500	16 19 37.90	160.28	26 48 32.5	362.6	75.10	16 2.6	58 47.0	I. N.
28	U	6 26.50	2.525	16 51 51.36	161.74	−27 47 2.4	− 221.5	75.46	15 58.3	58 31.0	I. N.
28	L	18 56.83	2.526	17 24 14.13	161.81	28 16 58.6	− 77.7	75.46	15 53.8	58 14.6	I. N.S
29	U	7 27.02	2.502	17 56 28.72	160.37	28 18 14.7	+ 64.4	75.09	15 49.3	57 58.1	I. N.S
29	L	19 56.78	2.455	18 28 17.58	157.53	27 51 35.5	200.9	74.36	15 44.8	57 41.6	I. S
30	U	8 25.85	2.388	18 59 25.15	153.54	−26 58 31.6	+ 328.0	73.34	15 40.3	57 25.1	I. S
30	L	20 54.04	2.308	19 29 39.22	148.68	25 41 11.7	443.1	72.09	15 35.8	57 8.7	I. S
31	U	9 21.20	2.219	19 58 51.79	143.35	24 2 8.9	544.9	70.70	15 31.4	56 52.6	I. S
31	L	21 47.28	2.128	20 26 59.05	137.87	22 4 10.2	632.5	69.25	15 27.1	56 36.7	I. S.
Sept. 1	U	10 12.27	2.039	20 54 1.02	132.51	−19 50 5.8	+ 705.9	67.81	15 22.9	56 21.1	I. S.
1	L	22 36.23	1.956	21 20 0.68	127.52	17 22 42.9	765.7	66.45	15 18.7	56 5.9	I. S.
2	U	10 59.24	1.881	21 45 3.22	123.02	14 44 38.7	812.8	65.21	15 14.7	55 51.1	I. S.
2	L	23 21.41	1.816	22 9 15.34	119.12	11 58 19.7	848.3	64.12	15 10.8	55 36.7	I. S.
3	U	11 42.87	1.762	22 32 44.60	115.88	− 9 6 0.5	+ 873.1	63.21	15 7.0	55 22.9	I. *N.S.*
4	L	0 3.75	1.720	22 55 39.04	113.33	6 9 42.9	888.1	62.48	15 3.4	55 9.6	*I.* II. N.S.
4	U	12 24.18	1.689	23 18 6.89	111.46	3 11 19.4	894.2	61.95	15 0.0	54 57.1	II. N.
5	L	0 44.31	1.669	23 40 16.34	110.26	− 0 12 32.9	892.1	61.62	14 56.8	54 45.6	II. N.
5	U	13 4.27	1.660	0 2 15.53	109.72	+ 2 45 1.5	+ 882.3	61.49	14 54.0	54 35.2	II. N.
6	L	1 24.20	1.662	0 24 12.38	109.85	5 39 54.2	865.2	61.55	14 51.5	54 26.0	II. N.
6	U	13 44.21	1.675	0 46 14.62	110.62	8 30 39.3	841.1	61.80	14 49.4	54 18.3	II. N.
7	L	2 4.43	1.698	1 8 29.78	112.00	11 15 52.8	810.0	62.22	14 47.7	54 12.1	II. N.
7	U	14 24.99	1.730	1 31 5.02	113.98	+13 54 11.3	+ 772.0	62.81	14 46.5	54 7.8	II. N.

Aug. 29, U Defective Illumination of *N* 0″.50 **Sept. 3, U Defective Illumination of *N* 0″.55**

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Sept. 7	U	14 24.99	1.730	1 31 5.02	113.98	+13 54 11.3	+ 772.0	62.81	14 46.5	54 7.8	II. N.
8	L	2 46.00	1.772	1 54 7.15	116.49	16 24 9.5	726.6	63.56	14 45.9	54 5.4	II. N.
8	U	15 7.56	1.822	2 17 42.39	119.48	18 44 19.6	673.7	64.43	14 45.8	54 5.1	II. N.
9	L	3 29.76	1.879	2 41 56.19	122.90	20 53 9.6	613.1	65.41	14 46.4	54 7.2	II. N.
9	U	15 52.67	1.941	3 6 53.02	126.62	+22 49 3.5	+ 544.3	66.46	14 47.6	54 11.7	II. N.
10	L	4 16.35	2.006	3 32 35.83	130.53	24 30 20.7	467.1	67.54	14 49.5	54 18.8	II. N.
10	U	16 40.81	2.071	3 59 5.85	134.46	25 55 18.3	381.0	68.59	14 52.1	54 28.4	II. N.
11	L	5 6.04	2.133	4 26 22.14	138.21	27 2 12.4	286.6	69.58	14 55.5	54 40.8	II. N.
11	U	17 31.98	2.189	4 54 21.33	141.57	+27 49 23.1	+ 183.9	70.47	14 59.6	54 55.8	II. N.
12	L	5 58.54	2.236	5 22 57.60	144.37	28 15 18.7	+ 74.2	71.19	15 4.5	55 13.6	II. N.
12	U	18 25.59	2.269	5 52 2.86	146.38	28 18 41.9	− 41.2	71.71	15 10.0	55 33.8	II. N.
13	L	6 52.95	2.288	6 21 27.36	147.55	27 58 35.3	160.4	71.99	15 16.1	55 56.3	II. S.
13	U	19 20.45	2.293	6 51 0.47	147.82	+27 14 26.1	− 281.2	72.03	15 22.8	56 21.0	II. S.
14	L	7 47.93	2.284	7 20 31.74	147.26	26 6 9.8	401.2	71.87	15 30.0	56 47.4	II. S.
14	U	20 15.22	2.263	7 49 51.91	146.00	24 34 11.3	518.0	71.52	15 37.6	57 15.1	II. S.
15	L	8 42.20	2.234	8 18 53.68	144.25	22 39 24.2	628.9	71.03	15 45.4	57 43.7	II. S.
15	U	21 8.80	2.200	8 47 32.37	142.20	+20 23 9.6	− 732.1	70.47	15 53.2	58 12.5	II. S.
16	L	9 34.99	2.165	9 15 46.04	140.09	17 47 12.7	825.6	69.89	16 0.9	58 40.8	II. S.
16	U	22 0.77	2.133	9 43 35.47	138.19	14 53 40.5	907.7	69.36	16 8.4	59 8.1	II. S.
17	L	10 26.20	2.107	10 11 3.89	136.62	11 44 58.9	976.8	68.93	16 15.3	59 33.7	II. S.
17	U	22 51.37	2.090	10 38 16.60	135.60	+ 8 23 51.7	−1031.7	68.64	16 21.6	59 56.7	II. S.
18	L	11 16.40	2.083	11 5 20.56	135.20	4 53 18.1	1071.1	68.52	16 27.0	60 16.5	
18	U	23 41.42	2.089	11 32 23.95	135.51	+ 1 16 31.5	1093.8	68.60	16 31.4	60 32.6	
19	L	12 6.57	2.107	11 59 35.74	136.59	− 2 23 1.6	1098.7	68.88	16 34.6	60 44.5	
20	U	0 32.02	2.138	12 27 5.28	138.47	− 6 1 43.0	−1085.0	69.38	16 36.6	60 51.7	
20	L	12 57.92	2.181	12 55 1.83	141.08	9 35 45.9	1052.2	70.07	16 37.3	60 54.2	I. N.
21	U	1 24.42	2.236	13 23 33.91	144.38	13 1 17.9	999.7	70.93	16 36.7	60 52.0	I. N.
21	L	13 51.62	2.299	13 52 48.71	148.17	16 14 23.7	927.9	71.92	16 34.8	60 45.2	I. N.
22	U	2 19.61	2.367	14 22 51.11	152.24	−19 11 12.8	− 837.1	72.98	16 31.9	60 34.4	I. N.
22	L	14 48.42	2.435	14 53 42.86	156.33	21 48 4.4	728.6	74.02	16 28.0	60 20.1	I. N.
23	U	3 18.01	2.496	15 25 21.62	160.03	24 1 38.1	604.5	74.96	16 23.3	60 2.8	I. N.
23	L	15 48.27	2.544	15 57 40.37	162.93	25 49 3.2	467.8	75.70	16 17.9	59 43.0	I. N.
24	U	4 19.00	2.573	16 30 27.31	164.66	−27 8 11.2	− 322.5	76.15	16 12.0	59 21.3	I. N.
24	L	16 49.93	2.578	17 3 26.67	164.96	27 57 44.7	172.9	76.24	16 5.8	58 58.5	I. N.
25	U	5 20.77	2.557	17 36 20.09	163.66	28 17 24.0	− 24.1	75.94	15 59.4	58 35.2	I. N.
25	L	17 51.19	2.510	18 8 48.81	160.86	28 7 47.1	+ 119.0	75.26	15 53.0	58 11.7	I. S.
26	U	6 20.92	2.442	18 40 35.81	156.76	−27 30 24.0	+ 253.0	74.25	15 46.7	57 48.5	I. S.
26	L	18 49.73	2.358	19 11 27.49	151.71	26 27 25.1	374.6	72.98	15 40.5	57 25.9	I. S.
27	U	7 17.47	2.265	19 41 14.77	146.10	25 1 28.2	482.4	71.55	15 34.6	57 4.2	I. S.
27	L	19 44.07	2.168	20 9 53.07	140.29	23 15 24.1	575.7	70.04	15 29.0	56 43.5	I. S.
28	U	8 9.51	2.073	20 37 22.00	134.59	−21 12 6.3	+ 654.9	68.52	15 23.7	56 24.0	I. S.
28	L	20 33.85	1.984	21 3 44.42	129.23	18 54 21.5	720.4	67.06	15 18.7	56 5.7	I. S.
29	U	8 57.16	1.904	21 29 5.59	124.41	16 24 47.0	773.4	65.72	15 14.0	55 48.6	I. S.
29	L	21 19.58	1.834	21 53 32.47	120.19	13 45 46.5	814.9	64.53	15 9.7	55 32.8	I. S.
30	U	9 41.22	1.775	22 17 12.78	116.65	−10 59 31.4	+ 846.0	63.51	15 5.8	55 18.4	I. S.

MOON-CULMINATIONS, 1914.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Sept. 30	U	9 41.22	1.775	22 17 12.78	116.65	−10 59 31.4	+ 846.0	63.51	15 5.8	55 18.4	I. S.
30	L	22 2.23	1.728	22 40 14.82	113.80	8 8 0.9	867.5	62.67	15 2.1	55 5.0	I. S.
Oct. 1	U	10 22.74	1.692	23 2 47.00	111.67	5 13 4.6	880.4	62.03	14 58.8	54 52.9	I. S.
1	L	22 42.89	1.668	23 24 57.65	110.23	− 2 16 23.6	885.0	61.60	14 55.8	54 41.9	I. S.
2	U	11 2.82	1.655	23 46 54.96	109.46	+ 0 40 27.3	+ 882.0	61.35	14 53.1	54 32.0	I. S.
2	L	23 22.66	1.653	0 8 46.86	109.32	3 35 57.5	871.6	61.31	14 50.8	54 23.4	I. *N*. S.
3	U	11 42.53	1.661	0 30 41.05	109.80	6 28 38.8	854.0	61.45	14 48.7	54 15.9	I. *II*. N. *S*.
4	L	0 2.57	1.680	0 52 44.84	110.92	9 17 4.6	829.0	61.76	14 47.0	54 9.6	II. N.
4	U	12 22.88	1.707	1 15 5.27	112.59	+11 59 47.5	+ 796.8	62.25	14 45.7	54 4.6	II. N.
5	L	0 43.58	1.744	1 37 48.90	114.77	14 35 18.8	757.1	62.89	14 44.7	54 1.0	II. N.
5	U	13 4.77	1.788	2 1 1.74	117.43	17 2 7.7	709.7	63.66	14 44.1	53 58.8	II. N.
6	L	1 26.52	1.839	2 24 49.03	120.51	19 18 39.7	654.3	64.53	14 43.9	53 58.2	II. N.
6	U	13 48.92	1.895	2 49 15.03	123.88	+21 23 18.6	+ 590.8	65.49	14 44.2	53 59.3	II. N.
7	L	2 12.02	1.954	3 14 22.75	127.43	23 14 25.1	518.9	66.48	14 45.0	54 2.3	II. N.
7	U	14 35.83	2.014	3 40 13.55	131.02	24 50 19.4	438.7	67.49	14 46.4	54 7.3	II. N.
8	L	3 0.35	2.072	4 6 46.91	134.50	26 9 22.6	350.5	68.44	14 48.3	54 14.3	II. N.
8	U	15 25.53	2.124	4 34 0.21	137.66	+27 10 0.7	+ 254.6	69.30	14 50.8	54 23.6	II. N.
9	L	3 51.29	2.169	5 1 48.68	140.34	27 50 48.0	152.2	70.03	14 54.0	54 35.2	II. N.
9	U	16 17.53	2.202	5 30 5.43	142.35	28 10 31.6	+ 44.3	70.58	14 57.8	54 49.3	II. N.
10	L	4 44.10	2.223	5 58 42.08	143.64	28 8 15.7	− 67.4	70.94	15 2.3	55 5.7	II. N. *S*.
10	U	17 10.84	2.232	6 27 29.29	144.13	+27 43 24.8	− 181.2	71.08	15 7.5	55 24.7	II. *N*. S.
11	L	5 37.60	2.227	6 56 17.64	143.83	26 55 46.7	295.0	71.02	15 13.3	55 46.0	II. S.
11	U	18 4.24	2.211	7 24 58.54	142.89	25 45 31.5	407.0	70.78	15 19.7	56 9.5	II. S.
12	L	6 30.64	2.187	7 53 24.97	141.44	24 13 13.5	515.3	70.41	15 26.7	56 35.1	II. S.
12	U	18 56.71	2.158	8 21 32.04	139.70	+22 19 46.0	− 618.3	69.94	15 34.2	57 2.5	II. S.
13	L	7 22.42	2.127	8 49 17.34	137.86	20 6 21.2	714.6	69.44	15 42.0	57 31.3	II. S.
13	U	19 47.78	2.099	9 16 40.88	136.10	17 34 27.8	802.8	68.95	15 50.1	58 1.0	II. S.
14	L	8 12.81	2.074	9 43 45.10	134.65	14 45 49.7	881.8	68.54	15 58.3	58 31.2	II. S.
14	U	20 37.59	2.058	10 10 34.50	133.66	+11 42 24.2	− 950.3	68.24	16 6.5	59 1.3	II. S.
15	L	9 2.23	2.051	10 37 15.38	133.26	8 26 25.1	1007.3	68.10	16 14.4	59 30.4	II. S.
15	U	21 26.86	2.056	11 3 55.42	133.55	5 0 21.9	1050.9	68.15	16 21.9	59 57.7	II. S.
16	L	9 51.62	2.074	11 30 43.49	134.61	+ 1 27 2.1	1079.7	68.40	16 28.7	60 22.5	II. S.
16	U	22 16.68	2.105	11 57 49.18	136.48	− 2 10 27.2	−1092.2	68.86	16 34.5	60 44.0	II. S.
17	L	10 42.19	2.150	12 25 22.49	139.21	5 48 38.3	1086.4	69.55	16 39.2	61 1.4	II. S.
17	U	23 8.33	2.208	12 53 33.33	142.73	9 23 43.0	1060.9	70.44	16 42.7	61 14.1	
18	L	11 35.24	2.279	13 22 30.83	146.96	12 51 35.4	1014.1	71.51	16 44.7	61 21.6	
19	U	0 3.06	2.358	13 52 22.54	151.72	−16 7 54.9	− 945.3	72.71	16 45.3	61 23.7	
19	L	12 31.85	2.442	14 23 13.31	156.74	19 8 15.0	854.3	73.96	16 44.4	61 20.3	
20	U	1 1.65	2.523	14 55 4.12	161.66	21 48 13.4	742.0	75.18	16 42.0	61 11.5	I. N.
20	L	13 32.37	2.595	15 27 50.78	165.98	24 3 47.2	610.7	76.25	16 38.2	60 57.7	I. N.
21	U	2 3.85	2.649	16 1 23.28	169.20	−25 51 29.1	− 464.1	77.05	16 33.3	60 39.6	I. N.
21	L	14 35.83	2.677	16 35 25.72	170.90	27 8 46.1	307.5	77.49	16 27.4	60 17.8	I. N.
22	U	3 7.97	2.674	17 9 37.60	170.75	27 54 13.7	− 147.0	77.48	16 20.6	59 52.9	I. N.
22	L	15 39.89	2.640	17 43 36.02	168.66	28 7 43.6	+ 11.1	77.02	16 13.3	59 26.1	I. N.
23	U	4 11.21	2.576	18 16 58.60	164.82	−27 50 21.2	+ 160.9	76.13	16 5.6	58 58.0	I. N.

Oct. 3, U Defective Illumination of *II* 0°.02
Oct. 3, U Defective Illumination of *S* 0″.41

Oct. 10, U Defective Illumination of *N* 0″.45

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct 23	U	4 11.21	2.576	18 16 58.60	164.82	−27 50 21.2	+ 160.9	76.13	16 5.6	58 58.0	I. N.
23	L	16 41.61	2.489	18 49 26.20	159.58	27 4 13.4	298.0	74.89	15 57.8	58 29.3	I. S.
24	U	5 10.87	2.386	19 20 44.91	153.42	25 52 11.6	419.5	73.39	15 50.0	58 0.7	I. S.
24	L	17 38.85	2.277	19 50 46.54	146.82	24 17 30.6	524.4	71.74	15 42.4	57 32.8	I. S.
25	U	6 5.51	2.167	20 19 28.48	140.20	−22 23 31.9	+ 612.7	70.05	15 35.1	57 5.9	I. S.
25	L	18 30.87	2.062	20 46 52.66	133.90	20 13 29.4	685.2	68.40	15 28.2	56 40.5	I. S.
26	U	6 55.03	1.966	21 13 4.32	128.15	17 50 22.6	743.7	66.85	15 21.7	56 16.8	I. S.
26	L	19 18.10	1.882	21 38 10.94	123.08	15 16 52.5	789.4	65.45	15 15.7	55 54.9	I. S.
27	U	7 40.24	1.810	22 2 21.23	118.77	−12 35 21.1	+ 824.1	64.23	15 10.3	55 34.9	I. S.
27	L	20 1.60	1.752	22 25 44.50	115.25	9 47 53.7	848.9	63.21	15 5.4	55 17.0	I. S.
28	U	8 22.34	1.706	22 48 30.24	112.51	6 56 19.8	865.2	62.41	15 1.1	55 1.1	I. S.
28	L	20 42.60	1.673	23 10 47.81	110.54	4 2 19.0	873.7	61.80	14 57.2	54 47.0	I. S.
29	U	9 2.55	1.653	23 32 46.23	109.32	− 1 7 21.4	+ 874.7	61.41	14 53.9	54 34.9	I. S.
29	L	21 22.33	1.645	23 54 34.28	108.81	+ 1 47 8.0	869.0	61.23	14 51.1	54 24.6	I. S.
30	U	9 42.07	1.648	0 16 20.28	108.98	4 39 47.1	856.4	61.25	14 48.8	54 16.1	I. S.
30	L	22 1.91	1.661	0 38 12.25	109.78	7 29 14.9	837.0	61.45	14 46.9	54 9.2	I. S.
31	U	10 21.97	1.685	1 0 17.71	111.22	+10 14 8.4	+ 810.6	61.83	14 45.4	54 3.7	I. S.
31	L	22 42.38	1.718	1 22 43.74	113.21	12 53 2.3	777.0	62.38	14 44.3	53 59.8	I. *N*. S.
Nov. 1	U	11 3.23	1.760	1 45 36.82	115.72	15 24 27.4	735.8	63.07	14 43.7	53 57.4	I. N. *S*.
1	L	23 24.64	1.809	2 9 2.69	118.66	17 46 49.5	686.5	63.89	14 43.4	53 56.4	I. N. *S*.
2	U	11 46.66	1.863	2 33 6.09	121.96	+19 58 30.9	+ 628.9	64.79	14 43.5	53 56.7	I. *II*. N.
3	L	0 9.37	1.922	2 57 50.53	125.48	21 57 49.4	562.7	65.76	14 44.0	53 58.4	II. N.
3	U	12 32.79	1.982	3 23 17.84	129.07	23 43 0.3	487.7	66.74	14 44.8	54 1.5	II. N.
4	L	0 56.92	2.040	3 49 27.97	132.58	25 12 20.6	404.3	67.69	14 46.0	54 6.0	II. N.
4	U	13 21.72	2.094	4 16 18.68	135.81	+26 24 10.5	+ 312.8	68.56	14 47.7	54 12.0	II. N.
5	L	1 47.13	2.139	4 43 45.40	138.55	27 16 59.3	214.2	69.31	14 49.8	54 19.6	II. N.
5	U	14 13.02	2.174	5 11 41.36	140.65	27 49 30.1	110.0	69.89	14 52.3	54 28.8	II. N.
6	L	2 39.25	2.196	5 39 57.99	141.98	28 0 43.9	+ 1.7	70.27	14 55.2	54 39.7	II. N.
6	U	15 5.67	2.204	6 8 25.57	142.47	+27 50 3.8	− 108.5	70.43	14 58.7	54 52.4	II. N. *S*.
7	L	3 32.10	2.199	6 36 54.09	142.15	27 17 17.1	219.1	70.39	15 2.7	55 7.0	II. *N*. S.
7	U	15 58.39	2.181	7 5 14.17	141.09	26 22 35.0	327.6	70.15	15 7.2	55 23.4	II. S.
8	L	4 24.41	2.154	7 33 17.93	139.47	25 6 31.9	432.3	69.76	15 12.2	55 41.8	II. S.
8	U	16 50.07	2.121	8 0 59.67	137.45	+23 30 1.1	− 531.9	69.26	15 17.7	56 2.2	II. S.
9	L	5 15.30	2.085	8 28 16.06	135.28	21 34 12.0	625.2	68.71	15 23.8	56 24.4	II. S.
9	U	17 40.10	2.049	8 55 6.39	133.14	19 20 25.4	711.3	68.16	15 30.3	56 48.2	II. S.
10	L	6 4.50	2.018	9 21 32.42	131.24	16 50 11.7	789.6	67.66	15 37.2	57 13.6	II. S.
10	U	18 28.55	1.993	9 47 38.03	129.76	+14 5 8.7	− 859.4	67.26	15 44.5	57 40.4	II. S.
11	L	6 52.36	1.978	10 13 29.05	128.84	11 7 1.2	920.2	67.00	15 52.0	58 8.1	II. S.
11	U	19 16.06	1.973	10 39 12.85	128.58	7 57 42.1	971.2	66.91	15 59.7	58 36.2	II. S.
12	L	7 39.78	1.982	11 4 58.08	129.09	4 39 15.1	1011.4	67.02	16 7.3	59 4.2	II. S.
12	U	20 3.68	2.004	11 30 54.47	130.45	+ 1 13 56.9	−1039.5	67.36	16 14.8	59 31.6	II. S.
13	L	8 27.94	2.042	11 57 12.47	132.70	− 2 15 39.0	1054.0	67.92	16 21.8	59 57.6	II. S.
13	U	20 52.75	2.095	12 24 3.03	135.89	5 46 37.9	1053.0	68.72	16 28.3	60 21.4	II. S.
14	L	9 18.27	2.163	12 51 37.19	139.96	9 15 42.3	1034.5	69.75	16 34.0	60 42.2	II. S.
14	U	21 44.70	2.244	13 20 5.45	144.89	−12 39 9.1	− 996.4	70.98	16 38.7	60 59.4	II. S.

Nov. 1, U Defective Illumination of *S* 0″.00   Nov. 6, U Defective Illumination of *S* 0″.57

MOON-CULMINATIONS, 1914.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 15	L	10 12.18	2.337	13 49 37.01	150.47	−15 52 50.7	−936.6	72.37	16 42.2	61 12.2	II. S.
15	U	22 40.82	2.437	14 20 18.53	156.47	18 52 19.7	854.1	73.83	16 44.3	61 20.0	II. N.
16	L	11 10.67	2.537	14 52 12.69	162.51	21 32 58.0	748.4	75.29	16 45.0	61 22.5	
16	U	23 41.68	2.629	15 25 16.61	168.01	23 50 11.7	620.5	76.61	16 44.2	61 19.6	
17	L	12 13.69	2.702	15 59 20.65	172.42	−25 39 52.7	−473.5	77.65	16 41.9	61 11.0	
18	U	0 46.42	2.747	16 34 7.87	175.12	26 58 41.7	312.9	78.30	16 38.1	60 57.4	I. N.
18	L	13 19.48	2.756	17 9 15.11	175.70	27 44 33.3	−145.2	78.45	16 33.1	60 38.8	I. N.
19	U	1 52.42	2.728	17 44 15.57	173.99	27 56 49.6	+ 21.7	78.09	16 27.0	60 16.4	I. N.
19	L	14 24.81	2.664	18 18 42.25	170.13	−27 36 24.1	+180.5	77.21	16 20.0	59 50.6	I. N.
20	U	2 56.24	2.571	18 52 11.71	164.54	26 45 30.3	325.6	75.91	16 12.3	59 22.4	I. S.
20	L	15 26.43	2.459	19 24 26.66	157.81	25 27 20.7	452.8	74.31	16 4.2	58 52.7	I. S.
21	U	3 55.22	2.338	19 55 16.85	150.51	23 45 38.8	560.8	72.54	15 55.9	58 22.4	I. S.
21	L	16 22.54	2.216	20 24 38.90	143.19	−21 44 18.3	+649.4	70.72	15 47.6	57 51.9	I. S.
22	U	4 48.43	2.100	20 52 34.93	136.23	19 27 2.7	720.2	68.94	15 39.5	57 22.2	I. S.
22	L	17 13.00	1.995	21 19 10.96	129.89	16 57 16.3	775.0	67.28	15 31.7	56 53.6	I. S.
23	U	5 36.37	1.903	21 44 35.58	124.36	14 17 58.7	815.9	65.79	15 24.4	56 26.6	I. S.
23	L	17 58.72	1.825	22 8 58.71	119.66	−11 31 43.7	+844.9	64.51	15 17.6	56 1.6	I. S.
24	U	6 20.23	1.762	22 32 30.87	115.85	8 40 43.6	863.7	63.43	15 11.3	55 38.7	I. S.
24	L	18 41.06	1.713	22 55 22.58	112.91	5 46 50.2	873.8	62.58	15 5.7	55 18.2	I. S.
25	U	7 1.40	1.678	23 17 44.19	110.84	− 2 51 41.3	876.4	61.97	15 0.8	55 0.1	I. S.
25	L	19 21.39	1.657	23 39 45.61	109.55	+ 0 3 17.5	+872.2	61.58	14 56.5	54 44.4	I. S.
26	U	7 41.21	1.649	0 1 36.37	109.05	2 56 47.2	861.6	61.41	14 52.9	54 31.2	I. S.
26	L	20 1.01	1.652	0 23 25.50	109.27	5 47 33.0	844.9	61.45	14 50.0	54 20.5	I. S.
27	U	8 20.92	1.668	0 45 21.60	110.21	8 34 20.4	821.9	61.68	14 47.7	54 12.0	I. S.
27	L	20 41.08	1.694	1 7 32.78	111.78	+11 15 54.1	+792.4	62.10	14 46.0	54 5.8	I. S.
28	U	9 1.61	1.730	1 30 6.59	113.98	13 50 54.1	756.3	62.68	14 44.9	54 1.7	I. S.
28	L	21 22.64	1.776	1 53 9.94	116.69	16 17 55.3	712.6	63.41	14 44.3	53 59.6	I. S.
29	U	9 44.26	1.829	2 16 48.83	119.87	18 35 26.4	661.1	64.26	14 44.2	53 59.3	I. S.
29	L	22 6.55	1.887	2 41 8.13	123.40	+20 41 49.2	+601.2	65.21	14 44.6	54 0.7	I. *N*.S.
30	U	10 29.56	1.949	3 6 11.21	127.14	22 35 19.9	532.4	66.19	14 45.4	54 3.7	I. *N*.S.
30	L	22 53.33	2.012	3 31 59.57	130.90	24 14 11.6	454.7	67.18	14 46.6	54 8.2	I. N.*S*.
Dec. 1	U	11 17.84	2.072	3 58 32.45	134.52	25 36 37.0	368.1	68.12	14 48.2	54 13.9	I. N.
1	L	23 43.04	2.126	4 25 46.59	137.76	+26 40 53.6	+273.4	68.95	14 50.1	54 21.0	I. *II*. N.
2	U	12 8.82	2.169	4 53 36.07	140.39	27 25 29.6	171.5	69.64	14 52.4	54 29.2	II. N.
3	L	0 35.05	2.200	5 21 52.59	142.23	27 49 9.3	+ 64.3	70.12	14 54.9	54 38.4	II. N.
3	U	13 1.57	2.216	5 50 25.97	143.17	27 51 0.0	− 46.3	70.38	14 57.7	54 48.8	II. N.
4	L	1 28.17	2.216	6 19 5.01	143.17	+27 30 35.6	−157.8	70.40	15 0.8	55 0.2	II. N.*S*.
4	U	13 54.69	2.201	6 47 38.59	142.27	26 47 58.2	268.0	70.20	15 4.2	55 12.7	II. N.*S*.
5	L	2 20.95	2.174	7 15 56.63	140.62	25 43 38.2	374.7	69.81	15 7.9	55 26.2	II. *N*.S.
5	U	14 46.81	2.136	7 43 51.06	138.38	24 18 31.0	475.7	69.27	15 11.9	55 40.8	II. S.
6	L	3 12.19	2.093	8 11 16.32	135.80	+22 33 51.2	−569.7	68.64	15 16.2	55 56.5	II. S.
6	U	15 37.04	2.048	8 38 9.72	133.10	20 31 9.2	655.9	67.96	15 20.7	56 13.3	II. S.
7	L	4 1.36	2.006	9 4 31.29	130.53	18 12 4.4	733.4	67.31	15 25.6	56 31.1	II. S.
7	U	16 25.20	1.968	9 30 23.53	128.25	15 38 22.1	802.1	66.73	15 30.8	56 50.1	II. S.
8	L	4 48.62	1.938	9 55 51.14	126.44	+12 51 50.6	−861.5	66.27	15 36.2	57 10.1	II. S.

Nov. 30, U Defective Illumination of *N* 0″.01

Dec. 4, U Defective Illumination of *S* 0″.07

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Dec. 8	U	17 11.74	1.918	10 21 0.58	125.24	+ 9 54 20.7	− 911.8	65.96	15 41.9	57 31.0	II. S.
9	L	5 34.70	1.910	10 15 59.76	124.76	6 47 45.0	952.5	65.84	15 47.8	57 52.7	II. S.
9	U	17 57.63	1.915	11 10 57.76	125.06	3 34 0.7	983.1	65.93	15 53.9	58 14.9	II. S.
10	L	6 20.71	1.934	11 36 4.54	126.24	+ 0 15 12.0	1003.1	66.24	16 0.0	58 37.3	II. S.
10	U	18 44.11	1.969	12 1 30.86	128.31	− 3 6 27.1	−1011.3	66.79	16 6.0	58 59.5	II. S.
11	L	7 8.02	2.020	12 27 27.92	131.36	6 28 28.3	1006.5	67.59	16 11.9	59 21.1	II. S.
11	U	19 32.64	2.086	12 54 7.13	135.34	9 48 5.1	987.0	68.62	16 17.5	59 41.6	II. S.
12	L	7 58.14	2.167	13 21 39.67	140.22	13 2 9.7	950.8	69.87	16 22.7	60 0.5	II. S.
12	U	20 24.70	2.261	13 50 15.71	145.88	−16 7 10.6	− 896.0	71.28	16 27.2	60 17.0	II. S.
13	L	8 52.45	2.365	14 20 3.44	152.13	18 59 13.0	820.8	72.81	16 30.9	60 30.7	II. S.
13	U	21 21.47	2.472	14 51 7.73	158.58	21 34 4.4	724.1	74.37	16 33.7	60 40.9	II. S.
14	L	9 51.76	2.575	15 23 28.43	164.77	23 47 24.8	605.7	75.84	16 35.3	60 47.0	II. S.
14	U	22 23.21	2.664	15 56 58.97	170.12	−25 35 2.7	− 467.4	77.08	16 35.8	60 48.7	II. N.
15	L	10 55.59	2.727	16 31 25.29	173.96	26 53 19.8	313.0	77.96	16 35.0	60 45.8	
15	U	23 28.54	2.758	17 6 26.22	175.81	27 39 35.5	− 148.4	78.38	16 32.9	60 38.3	
16	L	12 1.63	2.750	17 41 35.36	175.31	27 52 29.8	+ 19.2	78.27	16 29.6	60 26.2	
17	U	0 34.39	2.703	18 16 24.45	172.49	−27 32 14.0	+ 182.0	77.61	16 25.1	60 9.7	
17	L	13 6.38	2.623	18 50 27.28	167.68	26 40 29.5	333.0	76.49	16 19.6	59 49.3	I. N.
18	U	1 37.25	2.519	19 23 22.97	161.41	25 20 9.9	467.1	75.00	16 13.2	59 25.9	I. N.
18	L	14 6.78	2.401	19 54 57.74	154.30	23 34 57.4	581.5	73.30	16 6.2	59 0.1	I. S.
19	U	2 34.85	2.278	20 25 5.11	146.94	−21 28 54.9	+ 675.5	71.49	15 58.7	58 32.7	I. S.
19	L	15 1.47	2.159	20 53 44.99	139.79	19 6 5.4	749.6	69.70	15 51.0	58 4.3	I. S.
20	U	3 26.71	2.050	21 21 2.01	133.16	16 30 15.8	805.8	68.01	15 43.2	57 35.7	I. S.
20	L	15 50.71	1.952	21 47 4.00	127.30	13 44 48.7	846.3	66.48	15 35.5	57 7.4	I. S.
21	U	4 13.62	1.869	22 12 0.61	122.28	−10 52 39.8	+ 873.1	65.14	15 28.0	56 40.0	I. S.
21	L	16 35.62	1.800	22 36 2.38	118.17	7 56 18.5	888.6	64.03	15 21.0	56 14.2	I. S.
22	U	4 56.89	1.747	22 59 20.18	114.94	4 57 51.0	894.5	63.14	15 14.4	55 50.2	I. S.
22	L	17 17.60	1.708	23 22 4.63	112.62	− 1 59 4.4	892.0	62.49	15 8.4	55 28.2	I. S.
23	U	5 37.93	1.683	23 44 26.07	111.11	+ 0 58 29.2	+ 882.4	62.07	15 3.1	55 8.6	I. S.
23	L	17 58.04	1.672	0 6 34.44	110.42	3 53 28.9	866.4	61.88	14 58.5	54 51.6	I. S.
24	U	6 18.10	1.673	0 28 39.20	110.51	6 44 39.6	844.3	61.90	14 54.6	54 37.3	I. S.
24	L	18 38.24	1.686	0 50 49.36	111.32	9 30 49.8	816.3	62.12	14 51.4	54 25.7	I. S.
25	U	6 58.61	1.711	1 13 13.41	112.82	+12 10 47.9	+ 782.2	62.53	14 49.0	54 16.7	I. S.
25	L	19 19.35	1.747	1 35 59.35	114.94	14 43 19.8	741.9	63.11	14 47.3	54 10.4	I. S.
26	U	7 40.57	1.792	1 59 14.46	117.66	17 7 6.3	694.7	63.85	14 46.3	54 6.8	I. S.
26	L	20 2.38	1.845	2 23 5.11	120.87	19 20 41.3	639.9	64.70	14 46.0	54 5.8	I. S.
27	U	8 24.88	1.905	2 47 36.61	124.44	+21 22 32.6	+ 577.2	65.64	14 46.3	54 7.0	I. S.
27	L	20 48.11	1.968	3 12 52.63	128.25	23 11 0.6	506.0	66.63	14 47.2	54 10.4	I. S.
28	U	9 12.11	2.032	3 38 54.95	132.12	24 44 21.1	425.9	67.63	14 48.7	54 15.9	I. S.
28	L	21 36.87	2.094	4 5 42.95	135.84	26 0 47.9	337.0	68.57	14 50.7	54 23.2	I. *N.* S.
29	U	10 2.34	2.149	4 33 13.37	139.16	+26 58 38.7	+ 240.0	69.40	14 53.2	54 32.2	I. N. *S.*
29	L	22 28.41	2.194	5 1 20.13	141.85	27 36 20.1	135.8	70.06	14 56.0	54 42.5	I. N. *S.*
30	U	10 54.94	2.225	5 29 54.60	143.74	27 52 35.5	+ 26.1	70.52	14 59.2	54 54.1	I. N.
30	L	23 21.75	2.241	5 58 46.06	144.68	27 46 31.0	− 87.2	70.73	15 2.6	55 6.7	I. N.
31	U	11 48.65	2.240	6 27 42.73	144.60	+27 17 41.6	− 201.0	70.71	15 6.2	55 20.1	I. N.

Dec. 29, U Defective Illumination of *S* 0″.00

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	23 4	17 45 53.96	−23 47 34.8	6.5	2.5	0.18	Feb. 16	1 16	22 59 33.39	−6 31 45.1	8.0	3.0	0.21
1	23 7	17 52 30.36	23 56 7.9	6.5	2.5	0.18	17	1 17	23 4 51.39	5 44 42.8	8.2	3.1	0.21
2	23 9	17 59 9.38	24 3 28.9	6.4	2.4	0.18	18	1 18	23 9 51.70	4 58 38.1	8.4	3.2	0.22
3	23 12	18 5 50.88	24 9 36.2	6.4	2.4	0.18	19	1 19	23 14 32.26	4 13 52.2	8.6	3.3	0.22
4	23 15	18 12 34.72	24 14 28.4	6.4	2.4	0.18	20	1 20	23 18 50.93	3 30 47.4	8.9	3.4	0.23
5	23 18	18 19 20.73	−24 18 4.0	6.3	2.4	0.18	21	1 20	23 22 45.60	−2 49 46.7	9.2	3.5	0.23
6	23 21	18 26 8.80	24 20 21.9	6.3	2.4	0.18	22	1 19	23 26 14.17	2 11 13.6	9.4	3.6	0.24
7	23 24	18 32 58.82	24 21 20.6	6.3	2.4	0.18	23	1 18	23 29 14.65	1 35 31.3	9.7	3.7	0.25
8	23 26	18 39 50.66	24 20 59.0	6.3	2.4	0.17	24	1 17	23 31 45.28	1 3 2.4	10.0	3.8	0.26
9	23 29	18 46 44.19	24 19 15.9	6.2	2.4	0.17	25	1 15	23 33 44.56	0 34 8.6	10.4	3.9	0.26
10	23 32	18 53 39.32	−24 16 10.2	6.2	2.4	0.17	26	1 12	23 35 11.28	−0 9 9.8	10.7	4.1	0.27
11	23 35	19 0 35.92	24 11 40.9	6.2	2.4	0.17	27	1 9	23 36 4.62	+0 11 35.9	11.0	4.2	0.28
12	23 38	19 7 33.87	24 5 46.9	6.2	2.4	0.17	28	1 5	23 36 24.27	0 27 53.5	11.4	4.3	0.29
13	23 41	19 14 33.10	23 58 27.3	6.2	2.3	0.17	Mar. 1	1 1	23 36 10.45	0 39 31.2	11.7	4.5	0.30
14	23 44	19 21 33.49	23 49 41.2	6.2	2.3	0.17	2	0 57	23 35 23.96	0 46 20.9	12.1	4.6	0.31
15	23 48	19 28 34.92	−23 39 27.7	6.2	2.3	0.17	3	0 52	23 34 6.24	+0 48 19.2	12.4	4.7	0.31
16	23 51	19 35 37.28	23 27 46.0	6.2	2.3	0.17	4	0 46	23 32 19.37	0 45 27.8	12.7	4.8	0.32
17	23 54	19 42 40.49	23 14 35.2	6.2	2.3	0.17	5	0 40	23 30 6.09	0 37 53.8	13.0	4.9	0.33
18	23 57	19 49 44.43	22 59 54.8	6.2	2.3	0.17	6	0 33	23 27 29.74	0 25 50.6	13.3	5.1	0.34
20	0 0	19 56 48.99	22 43 44.0	6.2	2.3	0.17	7	0 26	23 24 34.21	+0 9 37.1	13.6	5.2	0.34
21	0 3	20 3 54.07	−22 26 2.2	6.2	2.3	0.17	8	0 19	23 21 23.80	−0 10 22.2	13.8	5.3	0.35
22	0 6	20 10 59.56	22 6 48.8	6.2	2.3	0.17	9	0 12	23 18 3.15	0 33 37.8	14.0	5.3	0.35
23	0 9	20 18 5.34	21 46 3.4	6.2	2.4	0.17	10	0 4	23 14 37.00	0 59 36.0	14.2	5.4	0.36
24	0 12	20 25 11.30	21 23 45.6	6.2	2.4	0.17	10	23 57	23 11 10.07	1 27 40.7	14.3	5.4	0.36
25	0 16	20 32 17.32	20 59 55.2	6.2	2.4	0.17	11	23 50	23 7 46.88	1 57 14.5	14.3	5.4	0.36
26	0 19	20 39 23.26	−20 34 31.9	6.3	2.4	0.17	12	23 43	23 4 31.67	−2 27 40.1	14.3	5.4	0.36
27	0 22	20 46 28.98	20 7 35.7	6.3	2.4	0.17	13	23 36	23 1 28.20	2 58 21.7	14.3	5.4	0.36
28	0 25	20 53 34.36	19 39 6.7	6.3	2.4	0.17	14	23 29	22 58 39.69	3 28 46.0	14.3	5.4	0.36
29	0 28	21 0 39.23	19 9 5.2	6.3	2.4	0.17	15	23 22	22 56 8.78	3 58 23.4	14.2	5.4	0.36
30	0 31	21 7 43.39	18 37 31.7	6.4	2.4	0.17	16	23 16	22 53 57.54	4 26 48.4	14.1	5.3	0.36
31	0 34	21 14 46.63	−18 4 26.8	6.4	2.4	0.17	17	23 11	22 52 7.46	−4 53 39.4	14.0	5.3	0.36
Feb. 1	0 38	21 21 48.75	17 29 51.6	6.5	2.5	0.17	18	23 5	22 50 39.53	5 18 39.2	13.8	5.2	0.35
2	0 41	21 28 49.48	16 53 47.3	6.5	2.5	0.17	19	23 0	22 49 34.28	5 41 34.5	13.6	5.2	0.35
3	0 44	21 35 48.53	16 16 15.9	6.6	2.5	0.17	20	22 55	22 48 51.83	6 2 15.4	13.4	5.1	0.34
4	0 47	21 42 45.54	15 37 19.6	6.6	2.5	0.17	21	22 51	22 48 31.97	6 20 35.2	13.2	5.0	0.34
5	0 50	21 49 40.11	−14 57 1.1	6.7	2.5	0.17	22	22 47	22 48 34.24	−6 36 29.9	13.0	4.9	0.33
6	0 52	21 56 31.76	14 15 23.9	6.8	2.6	0.18	23	22 44	22 48 57.97	6 49 57.7	12.8	4.8	0.33
7	0 55	22 3 19.95	13 32 32.3	6.8	2.6	0.18	24	22 41	22 49 42.38	7 0 58.1	12.5	4.8	0.32
8	0 58	22 10 4.03	12 48 31.4	6.9	2.6	0.18	25	22 38	22 50 46.55	7 9 32.1	12.3	4.7	0.32
9	1 1	22 16 43.26	12 3 27.4	7.0	2.7	0.18	26	22 35	22 52 9.52	7 15 42.0	12.1	4.6	0.31
10	1 3	22 23 16.80	−11 17 27.5	7.1	2.7	0.18	27	22 33	22 53 50.30	−7 19 30.6	11.9	4.5	0.30
11	1 6	22 29 43.67	10 30 40.5	7.3	2.8	0.19	28	22 31	22 55 47.90	7 21 1.1	11.7	4.4	0.30
12	1 8	22 36 2.75	9 43 16.3	7.4	2.8	0.19	29	22 29	22 58 1.34	7 20 17.4	11.5	4.4	0.29
13	1 10	22 42 12.76	8 55 26.6	7.5	2.9	0.19	30	22 28	23 0 29.66	7 17 23.2	11.3	4.3	0.29
14	1 12	22 48 12.27	8 7 24.6	7.7	2.9	0.20	31	22 27	23 3 11.97	7 12 22.2	11.1	4.2	0.28
15	1 14	22 53 59.72	− 7 19 25.2	7.8	3.0	0.20	Apr. 1	22 26	23 6 7.39	−7 5 18.6	10.9	4.1	0.28
16	1 16	22 59 33.39	− 6 31 45.1	8.0	3.0	0.21	2	22 25	23 9 15.11	−6 56 16.3	10.7	4.1	0.27

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Apr. 1	22 26	23 6 7.39	− 7 5 18.6	10.9	4.1	0.28
2	22 25	23 9 15.11	6 56 16.3	10.7	4.1	0.27
3	22 24	23 12 34.37	6 45 19.0	10.5	4.0	0.27
4	22 24	23 16 4.47	6 32 30.5	10.3	3.9	0.26
5	22 24	23 19 44.77	6 17 54.4	10.1	3.9	0.26
6	22 23	23 23 34.68	− 6 1 33.9	10.0	3.8	0.25
7	22 23	23 27 33.67	5 43 32.4	9.8	3.7	0.25
8	22 24	23 31 41.25	5 23 53.0	9.7	3.7	0.24
9	22 24	23 35 56.98	5 2 38.6	9.5	3.6	0.24
10	22 24	23 40 20.47	4 39 52.2	9.4	3.6	0.24
11	22 25	23 44 51.38	− 4 15 36.6	9.2	3.5	0.23
12	22 26	23 49 29.40	3 49 54.3	9.1	3.4	0.23
13	22 26	23 54 14.29	3 22 47.9	9.0	3.4	0.23
14	22 27	23 59 5.82	2 54 19.7	8.8	3.3	0.22
15	22 28	0 4 3.80	2 24 32.2	8.7	3.3	0.22
16	22 30	0 9 8.07	− 1 53 27.8	8.6	3.2	0.22
17	22 31	0 14 18.54	1 21 8.8	8.5	3.2	0.21
18	22 32	0 19 35.11	0 47 37.4	8.3	3.2	0.21
19	22 33	0 24 57.74	− 0 12 55.6	8.2	3.1	0.21
20	22 35	0 30 26.43	+ 0 22 54.4	8.1	3.1	0.21
21	22 37	0 36 1.18	+ 0 59 50.3	8.0	3.0	0.20
22	22 38	0 41 42.03	1 37 49.9	7.9	3.0	0.20
23	22 40	0 47 29.05	2 16 51.0	7.8	3.0	0.20
24	22 42	0 53 22.34	2 56 51.3	7.7	2.9	0.20
25	22 44	0 59 22.03	3 37 48.5	7.6	2.9	0.19
26	22 46	1 5 28.28	+ 4 19 40.1	7.5	2.9	0.19
27	22 49	1 11 41.26	5 2 23.5	7.5	2.8	0.19
28	22 51	1 18 1.16	5 45 56.0	7.4	2.8	0.19
29	22 53	1 24 28.20	6 30 14.5	7.3	2.8	0.19
30	22 56	1 31 2.60	7 15 15.5	7.2	2.7	0.19
May 1	22 59	1 37 44.61	+ 8 0 55.5	7.2	2.7	0.18
2	23 2	1 44 34.49	8 47 10.8	7.1	2.7	0.18
3	23 5	1 51 32.50	9 33 56.9	7.0	2.7	0.18
4	23 8	1 58 38.88	10 21 8.9	7.0	2.6	0.18
5	23 11	2 5 53.89	11 8 41.4	6.9	2.6	0.18
6	23 15	2 13 17.73	+11 56 28.3	6.9	2.6	0.18
7	23 18	2 20 50.61	12 44 22.9	6.8	2.6	0.18
8	23 22	2 28 32.67	13 32 17.8	6.8	2.6	0.18
9	23 26	2 36 23.99	14 20 4.7	6.8	2.6	0.18
10	23 30	2 44 24.58	15 7 34.3	6.7	2.6	0.18
11	23 34	2 52 34.36	+15 54 36.9	6.7	2.5	0.18
12	23 38	3 0 53.13	16 41 1.7	6.7	2.5	0.18
13	23 43	3 9 20.58	17 26 37.4	6.7	2.5	0.18
14	23 48	3 17 56.23	18 11 11.8	6.6	2.5	0.18
15	23 52	3 26 39.48	18 54 32.3	6.6	2.5	0.18
16	23 57	3 35 29.57	+19 36 26.4	6.6	2.5	0.18
18	0 2	3 44 25.58	+20 16 41.8	6.7	2.5	0.18

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
May 16	23 57	3 35 29.57	+19 36 26.4	6.6	2.5	0.18
18	0 2	3 44 25.58	20 16 41.8	6.7	2.5	0.18
19	0 7	3 53 26.47	20 55 6.2	6.7	2.5	0.18
20	0 12	4 2 31.07	21 31 28.1	6.7	2.5	0.18
21	0 18	4 11 38.09	22 5 37.0	6.8	2.6	0.18
22	0 23	4 20 46.17	+22 37 24.0	6.8	2.6	0.19
23	0 28	4 29 53.94	23 6 41.4	6.9	2.6	0.19
24	0 33	4 39 0.00	23 33 23.1	6.9	2.6	0.19
25	0 38	4 48 2.98	23 57 24.9	7.0	2.6	0.19
26	0 43	4 57 1.54	24 18 44.3	7.1	2.7	0.20
27	0 48	5 5 54.44	+24 37 20.4	7.2	2.7	0.20
28	0 53	5 14 40.55	24 53 14.1	7.2	2.7	0.20
29	0 58	5 23 18.80	25 6 27.4	7.3	2.8	0.20
30	1 2	5 31 48.22	25 17 3.5	7.4	2.8	0.21
31	1 6	5 40 7.96	25 25 6.8	7.5	2.9	0.21
June 1	1 11	5 48 17.26	+25 30 42.5	7.7	2.9	0.21
2	1 15	5 56 15.49	25 33 56.3	7.8	2.9	0.22
3	1 19	6 4 2.09	25 34 54.7	7.9	3.0	0.22
4	1 22	6 11 36.55	25 33 44.2	8.0	3.0	0.22
5	1 26	6 18 58.46	25 30 31.7	8.2	3.1	0.23
6	1 29	6 26 7.44	+25 25 24.0	8.3	3.2	0.23
7	1 32	6 33 3.19	25 18 28.5	8.5	3.2	0.24
8	1 35	6 39 45.42	25 9 52.3	8.7	3.3	0.24
9	1 37	6 46 13.90	24 59 42.3	8.8	3.4	0.25
10	1 39	6 52 28.39	24 48 5.5	9.0	3.4	0.25
11	1 41	6 58 28.67	+24 35 8.9	9.2	3.5	0.26
12	1 43	7 4 14.56	24 20 59.3	9.4	3.5	0.26
13	1 45	7 9 45.85	24 5 43.6	9.6	3.6	0.26
14	1 46	7 15 2.33	23 49 28.1	9.7	3.7	0.27
15	1 47	7 20 3.80	23 32 19.5	9.9	3.8	0.27
16	1 48	7 24 50.06	+23 14 24.2	10.1	3.9	0.28
17	1 49	7 29 20.88	22 55 48.6	10.4	3.9	0.29
18	1 49	7 33 36.01	22 36 38.9	10.6	4.0	0.29
19	1 49	7 37 35.19	22 17 1.4	10.8	4.1	0.30
20	1 49	7 41 18.15	21 57 2.5	11.0	4.2	0.30
21	1 48	7 44 44.62	+21 36 48.3	11.2	4.3	0.31
22	1 47	7 47 54.31	21 16 24.8	11.5	4.4	0.31
23	1 46	7 50 46.90	20 55 58.4	11.7	4.4	0.32
24	1 45	7 53 22.07	20 35 35.3	11.9	4.5	0.32
25	1 43	7 55 39.52	20 15 21.7	12.2	4.6	0.33
26	1 41	7 57 38.92	+19 55 23.8	12.4	4.7	0.33
27	1 39	7 59 19.97	19 35 48.0	12.6	4.8	0.34
28	1 37	8 0 42.40	19 16 40.7	12.9	4.9	0.35
29	1 34	8 1 45.98	18 58 8.1	13.2	5.0	0.35
30	1 31	8 2 30.51	18 40 16.3	13.4	5.1	0.36
July 1	1 27	8 2 55.88	+18 23 11.5	13.6	5.2	0.36
2	1 23	8 3 2.07	+18 7 0.0	13.8	5.3	0.37

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	1 27	8 2 55.88	+18 23 11.5	13.6	5.2	0.36	Aug. 16	23 13	8 54 14.00	+18 32 26.0	7.4	2.8	0.20
2	1 23	8 3 2.07	18 7 0.0	13.8	5.3	0.37	17	23 17	9 2 2.19	18 8 48.8	7.3	2.8	0.19
3	1 19	8 2 49.17	17 51 47.5	14.1	5.3	0.37	18	23 21	9 9 55.53	17 42 36.5	7.2	2.7	0.19
4	1 15	8 2 17.42	17 37 39.8	14.3	5.4	0.38	19	23 25	9 17 52.13	17 13 56.0	7.0	2.7	0.19
5	1 10	8 1 27.19	17 24 42.2	14.5	5.5	0.38	20	23 29	9 25 50.24	16 42 55.5	6.9	2.6	0.18
6	1 5	8 0 19.05	+17 12 59.7	14.7	5.6	0.39	21	23 33	9 33 48.26	+16 9 44.3	6.8	2.6	0.18
7	0 59	7 58 53.77	17 2 36.9	14.8	5.6	0.39	22	23 37	9 41 44.77	15 34 32.2	6.8	2.6	0.18
8	0 54	7 57 12.37	16 53 37.8	15.0	5.7	0.39	23	23 41	9 49 38.57	14 57 29.7	6.7	2.5	0.18
9	0 48	7 55 16.08	16 46 5.8	15.1	5.7	0.40	24	23 45	9 57 28.63	14 18 47.5	6.7	2.5	0.17
10	0 42	7 53 6.38	16 40 3.5	15.2	5.8	0.40	25	23 49	10 5 14.10	13 38 36.0	6.6	2.5	0.17
11	0 36	7 50 45.02	+16 35 32.8	15.3	5.8	0.40	26	23 53	10 12 54.33	+12 57 5.5	6.5	2.5	0.17
12	0 29	7 48 13.99	16 32 34.5	15.3	5.8	0.40	27	23 56	10 20 28.80	12 14 25.9	6.5	2.5	0.17
13	0 23	7 45 35.49	16 31 8.8	15.3	5.8	0.40	29	0 0	10 27 57.14	11 30 46.5	6.5	2.5	0.17
14	0 16	7 42 51.94	16 31 14.8	15.3	5.8	0.40	30	0 3	10 35 19.12	10 46 16.1	6.4	2.4	0.17
15	0 9	7 40 5.91	16 32 50.7	15.3	5.8	0.40	31	0 6	10 42 34.60	10 1 2.8	6.4	2.4	0.17
16	0 2	7 37 20.11	+16 35 53.7	15.2	5.8	0.40	Sept. 1	0 10	10 49 43.53	+ 9 15 14.0	6.4	2.4	0.16
16	23 56	7 34 37.29	16 40 20.2	15.1	5.7	0.40	2	0 13	10 56 45.93	8 28 56.6	6.4	2.4	0.16
17	23 49	7 32 0.24	16 46 5.6	15.0	5.7	0.40	3	0 16	11 3 41.88	7 42 17.0	6.4	2.4	0.16
18	23 43	7 29 31.68	16 53 4.7	14.8	5.6	0.39	4	0 19	11 10 31.51	6 55 20.8	6.4	2.4	0.16
19	23 37	7 27 14.25	17 1 11.5	14.6	5.5	0.39	5	0 21	11 17 14.99	6 8 13.2	6.4	2.4	0.16
20	23 31	7 25 10.47	+17 10 19.5	14.4	5.5	0.38	6	0 24	11 23 52.49	+ 5 20 59.0	6.4	2.4	0.16
21	23 25	7 23 22.64	17 20 21.6	14.1	5.4	0.38	7	0 27	11 30 24.22	4 33 42.5	6.4	2.4	0.16
22	23 20	7 21 52.89	17 31 10.2	13.9	5.3	0.37	8	0 29	11 36 50.41	3 46 27.4	6.4	2.4	0.16
23	23 15	7 20 43.10	17 42 37.1	13.6	5.2	0.36	9	0 32	11 43 11.28	2 59 17.4	6.4	2.4	0.16
24	23 10	7 19 54.91	17 54 34.2	13.3	5.0	0.35	10	0 34	11 49 27.07	2 12 15.7	6.4	2.4	0.16
25	23 5	7 19 29.74	+18 6 52.8	13.0	4.9	0.35	11	0 36	11 55 38.00	+ 1 25 25.2	6.4	2.4	0.16
26	23 1	7 19 28.74	18 19 23.9	12.7	4.8	0.34	12	0 38	12 1 44.29	+ 0 38 48.5	6.4	2.4	0.16
27	22 58	7 19 52.86	18 31 58.1	12.4	4.7	0.33	13	0 40	12 7 46.18	− 0 7 31.9	6.4	2.4	0.16
28	22 55	7 20 42.85	18 44 26.0	12.1	4.6	0.32	14	0 42	12 13 43.89	0 53 33.7	6.5	2.4	0.16
29	22 52	7 21 59.23	18 56 37.8	11.7	4.5	0.31	15	0 44	12 19 37.61	1 39 14.8	6.5	2.5	0.16
30	22 50	7 23 42.35	+19 8 23.2	11.4	4.3	0.31	16	0 46	12 25 27.53	− 2 24 33.2	6.5	2.5	0.16
31	22 48	7 25 52.40	19 19 31.9	11.1	4.2	0.30	17	0 48	12 31 13.85	3 9 27.1	6.5	2.5	0.17
Aug. 1	22 47	7 28 29.41	19 29 53.2	10.8	4.1	0.29	18	0 50	12 36 56.74	3 53 54.8	6.6	2.5	0.17
2	22 46	7 31 33.27	19 39 16.4	10.5	4.0	0.28	19	0 51	12 42 36.34	4 37 54.5	6.6	2.5	0.17
3	22 46	7 35 3.69	19 47 30.4	10.2	3.9	0.27	20	0 53	12 48 12.82	5 21 24.7	6.6	2.5	0.17
4	22 46	7 39 0.27	+19 54 23.8	9.9	3.8	0.27	21	0 55	12 53 46.31	− 6 4 23.8	6.7	2.5	0.17
5	22 46	7 43 22.42	19 59 45.4	9.6	3.7	0.26	22	0 56	12 59 16.91	6 46 50.3	6.7	2.5	0.17
6	22 47	7 48 9.44	20 3 24.1	9.4	3.6	0.25	23	0 58	13 4 44.72	7 28 42.7	6.8	2.6	0.17
7	22 48	7 53 20.48	20 5 9.1	9.1	3.5	0.24	24	0 59	13 10 9.84	8 9 59.5	6.8	2.6	0.17
8	22 50	7 58 54.47	20 4 49.9	8.9	3.4	0.24	25	1 1	13 15 32.33	8 50 39.3	6.9	2.6	0.18
9	22 52	8 4 50.21	+20 2 16.7	8.6	3.3	0.23	26	1 2	13 20 52.23	− 9 30 40.7	6.9	2.6	0.18
10	22 54	8 11 6.32	19 57 20.5	8.4	3.2	0.23	27	1 3	13 26 9.57	10 10 2.1	7.0	2.6	0.18
11	22 57	8 17 41.24	19 49 53.8	8.2	3.1	0.22	28	1 5	13 31 24.36	10 48 42.1	7.0	2.7	0.18
12	23 0	8 24 33.26	19 39 50.4	8.0	3.0	0.22	29	1 6	13 36 36.58	11 26 39.1	7.1	2.7	0.18
13	23 3	8 31 40.54	19 27 5.7	7.8	3.0	0.21	30	1 7	13 41 46.21	12 3 51.5	7.2	2.7	0.19
14	23 6	8 39 1.12	+19 11 36.8	7.7	2.9	0.21	Oct. 1	1 8	13 46 53.17	−12 40 17.7	7.2	2.7	0.19
15	23 10	8 46 32.96	+18 53 23.1	7.5	2.9	0.20	2	1 9	13 51 57.35	−13 15 55.9	7.3	2.8	0.19

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	1 8	13 46 53.17	−12 40 17.7	7.2	2.7	0.19	Nov. 16	22 39	14 21 58.25	−11 43 28.5	10.5	4.0	0.27
2	1 9	13 51 57.35	13 15 55.9	7.3	2.8	0.19	17	22 36	14 23 7.55	11 44 23.5	10.2	3.9	0.26
3	1 10	13 56 58.64	13 50 44.4	7.4	2.8	0.19	18	22 34	14 24 51.60	11 49 50.8	9.9	3.7	0.25
4	1 11	14 1 56.86	14 24 41.3	7.5	2.8	0.19	19	22 32	14 27 7.37	11 59 22.6	9.6	3.6	0.25
5	1 12	14 6 51.83	14 57 44.5	7.6	2.9	0.20	20	22 31	14 29 51.78	12 12 30.1	9.3	3.5	0.24
6	1 13	14 11 43.29	−15 29 52.0	7.6	2.9	0.20	21	22 30	14 33 1.84	−12 28 45.1	9.1	3.5	0.24
7	1 14	14 16 30.94	16 1 1.3	7.7	2.9	0.20	22	22 30	14 36 34.76	12 47 40.5	8.9	3.4	0.23
8	1 15	14 21 14.44	16 31 9.9	7.8	3.0	0.21	23	22 29	14 40 27.94	13 8 51.1	8.7	3.3	0.23
9	1 16	14 25 53.37	17 0 15.3	8.0	3.0	0.21	24	22 30	14 44 39.04	13 31 53.7	8.5	3.2	0.22
10	1 16	14 30 27.26	17 28 14.5	8.1	3.1	0.21	25	22 30	14 49 5.98	13 56 27.0	8.3	3.1	0.22
11	1 17	14 34 55.57	−17 55 4.3	8.2	3.1	0.22	26	22 31	14 53 46.89	−14 22 12.4	8.1	3.1	0.21
12	1 17	14 39 17.65	18 20 41.4	8.3	3.2	0.22	27	22 32	14 58 40.13	14 48 52.9	7.9	3.0	0.21
13	1 18	14 43 32.79	18 45 2.0	8.4	3.2	0.23	28	22 33	15 3 44.29	15 16 13.6	7.8	3.0	0.20
14	1 18	14 47 40.16	19 8 2.0	8.6	3.3	0.23	29	22 34	15 8 58.14	15 44 1.2	7.6	2.9	0.20
15	1 18	14 51 38.83	19 29 36.8	8.7	3.3	0.23	30	22 36	15 14 20.62	16 12 4.2	7.5	2.9	0.20
16	1 18	14 55 27.75	−19 49 41.4	8.8	3.4	0.24	Dec. 1	22 37	15 19 50.81	−16 40 12.2	7.4	2.8	0.20
17	1 17	14 59 5.72	20 8 10.4	9.0	3.4	0.24	2	22 39	15 25 27.91	17 8 16.4	7.3	2.8	0.19
18	1 17	15 2 31.42	20 24 57.6	9.2	3.5	0.25	3	22 41	15 31 11.27	17 36 8.7	7.2	2.7	0.19
19	1 16	15 5 43.34	20 39 56.1	9.4	3.6	0.25	4	22 43	15 37 0.31	18 3 42.1	7.1	2.7	0.19
20	1 15	15 8 39.83	20 52 58.0	9.6	3.6	0.26	5	22 45	15 42 54.52	18 30 50.5	7.0	2.6	0.19
21	1 14	15 11 19.09	−21 3 55.1	9.8	3.7	0.27	6	22 47	15 48 53.49	−18 57 28.4	6.9	2.6	0.19
22	1 12	15 13 39.14	21 12 38.0	10.0	3.8	0.27	7	22 49	15 54 56.86	19 23 30.8	6.8	2.6	0.18
23	1 10	15 15 37.83	21 18 56.1	10.3	3.9	0.28	8	22 51	16 1 4.32	19 48 53.4	6.7	2.6	0.18
24	1 8	15 17 12.90	21 22 37.9	10.5	4.0	0.29	9	22 53	16 7 15.62	20 13 32.4	6.7	2.5	0.18
25	1 5	15 18 22.00	21 23 30.8	10.8	4.1	0.29	10	22 55	16 13 30.52	20 37 24.2	6.6	2.5	0.18
26	1 2	15 19 2.74	−21 21 21.3	11.0	4.2	0.30	11	22 58	16 19 48.81	−21 0 25.5	6.6	2.5	0.18
27	0 58	15 19 12.81	21 15 54.9	11.3	4.3	0.31	12	23 0	16 26 10.32	21 22 33.5	6.5	2.5	0.18
28	0 54	15 18 50.08	21 6 57.3	11.5	4.4	0.31	13	23 3	16 32 34.90	21 43 45.5	6.5	2.5	0.18
29	0 49	15 17 52.75	20 54 14.3	11.8	4.5	0.32	14	23 5	16 39 2.43	22 3 59.0	6.4	2.4	0.18
30	0 44	15 16 19.55	20 37 33.2	12.0	4.6	0.32	15	23 8	16 45 32.77	22 23 11.8	6.4	2.4	0.18
31	0 38	15 14 10.01	−20 16 44.4	12.3	4.6	0.33	16	23 10	16 52 5.80	−22 41 21.9	6.4	2.4	0.17
Nov. 1	0 31	15 11 24.69	19 51 43.0	12.5	4.7	0.34	17	23 13	16 58 41.43	22 58 27.2	6.3	2.4	0.17
2	0 24	15 8 5.44	19 22 31.2	12.7	4.8	0.34	18	23 16	17 5 19.56	23 14 25.6	6.3	2.4	0.17
3	0 16	15 4 15.58	18 49 21.0	12.8	4.9	0.34	19	23 18	17 12 0.10	23 29 15.6	6.2	2.4	0.17
4	0 8	15 0 0.01	18 12 36.2	12.9	4.9	0.34	20	23 21	17 18 42.97	23 42 55.5	6.2	2.4	0.17
4	23 59	14 55 25.20	−17 32 53.6	13.0	4.9	0.34	21	23 24	17 25 28.08	−23 55 23.6	6.2	2.4	0.17
5	23 50	14 50 38.97	16 51 3.3	13.0	4.9	0.34	22	23 27	17 32 15.35	24 6 38.5	6.2	2.3	0.17
6	23 42	14 45 50.14	16 8 7.1	13.0	4.9	0.34	23	23 30	17 39 4.71	24 16 38.6	6.2	2.3	0.17
7	23 33	14 41 7.94	15 25 15.6	12.9	4.9	0.34	24	23 33	17 45 56.06	24 25 22.6	6.1	2.3	0.17
8	23 25	14 36 41.45	14 43 42.7	12.8	4.9	0.33	25	23 36	17 52 49.34	24 32 49.1	6.1	2.3	0.17
9	23 17	14 32 38.95	−14 4 40.1	12.6	4.8	0.33	26	23 39	17 59 44.45	−24 38 56.5	6.1	2.3	0.17
10	23 9	14 29 7.48	13 29 12.0	12.3	4.7	0.32	27	23 42	18 6 41.30	24 43 43.7	6.1	2.3	0.17
11	23 2	14 26 12.48	12 58 10.7	12.1	4.6	0.31	28	23 45	18 13 39.80	24 47 9.6	6.1	2.3	0.17
12	22 56	14 23 57.64	12 32 14.1	11.8	4.5	0.31	29	23 48	18 20 39.87	24 49 12.7	6.1	2.3	0.17
13	22 51	14 22 24.93	12 11 45.0	11.5	4.4	0.30	30	23 51	18 27 41.40	24 49 51.8	6.1	2.3	0.17
14	22 46	14 21 34.83	−11 56 52.0	11.1	4.2	0.29	31	23 54	18 34 44.30	−24 49 5.9	6.1	2.3	0.17
15	22 42	14 21 26.53	−11 47 31.1	10.8	4.1	0.28	32	23 57	18 41 48.45	−24 46 53.8	6.1	2.3	0.17

VENUS, 1914.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	23 21	18 2 31.54	−23 29 2.6	5.3	5.1	0.37	Feb. 15	0 20	21 59 22.48	−13 45 29.4	5.1	5.0	0.34
1	23 22	18 8 1.11	23 30 47.6	5.3	5.1	0.37	16	0 21	22 4 13.65	13 20 5.4	5.1	5.0	0.34
2	23 24	18 13 30.79	23 31 49.1	5.2	5.1	0.37	17	0 22	22 9 3.71	12 54 19.8	5.1	5.0	0.34
3	23 25	18 19 0.51	23 32 6.7	5.2	5.1	0.37	18	0 23	22 13 52.70	12 28 13.3	5.1	5.0	0.34
4	23 27	18 24 30.21	23 31 40.4	5.2	5.1	0.37	19	0 23	22 18 40.63	12 1 46.7	5.1	5.0	0.34
5	23 28	18 29 59.82	−23 30 30.2	5.2	5.1	0.37	20	0 24	22 23 27.52	−11 35 0.7	5.1	5.0	0.34
6	23 30	18 35 29.28	23 28 36.2	5.2	5.1	0.37	21	0 25	22 28 13.40	11 7 56.1	5.1	5.0	0.34
7	23 31	18 40 58.53	23 25 58.5	5.2	5.1	0.37	22	0 26	22 32 58.31	10 40 33.8	5.1	5.0	0.34
8	23 33	18 46 27.51	23 22 37.3	5.2	5.1	0.37	23	0 27	22 37 42.28	10 12 54.4	5.1	5.0	0.34
9	23 34	18 51 56.16	23 18 32.6	5.2	5.1	0.37	24	0 28	22 42 25.33	9 44 58.8	5.1	5.0	0.34
10	23 36	18 57 24.42	−23 13 44.5	5.2	5.0	0.37	25	0 28	22 47 7.48	− 9 16 47.7	5.1	5.0	0.34
11	23 38	19 2 52.24	23 8 13.2	5.2	5.0	0.37	26	0 29	22 51 48.77	8 48 22.0	5.1	5.0	0.34
12	23 39	19 8 19.56	23 1 59.1	5.2	5.0	0.37	27	0 30	22 56 29.24	8 19 42.4	5.1	5.0	0.34
13	23 41	19 13 46.33	22 55 2.3	5.2	5.0	0.37	28	0 30	23 1 8.92	7 50 49.7	5.1	5.0	0.34
14	23 42	19 19 12.49	22 47 23.1	5.2	5.0	0.37	Mar. 1	0 31	23 5 47.84	7 21 44.6	5.1	5.0	0.34
15	23 44	19 24 37.99	−22 39 1.9	5.2	5.0	0.36	2	0 32	23 10 26.04	− 6 52 27.9	5.1	5.0	0.34
16	23 45	19 30 2.78	22 29 58.9	5.2	5.0	0.36	3	0 32	23 15 3.55	6 23 0.4	5.2	5.0	0.34
17	23 47	19 35 26.82	22 20 14.5	5.2	5.0	0.36	4	0 33	23 19 40.42	5 53 22.9	5.2	5.0	0.34
18	23 48	19 40 50.05	22 9 49.2	5.2	5.0	0.36	5	0 34	23 24 16.69	5 23 36.1	5.2	5.0	0.34
19	23 49	19 46 12.43	21 58 43.5	5.2	5.0	0.36	6	0 34	23 28 52.39	4 53 40.7	5.2	5.0	0.34
20	23 51	19 51 33.92	−21 46 57.7	5.2	5.0	0.36	7	0 35	23 33 27.56	− 4 23 37.5	5.2	5.0	0.34
21	23 52	19 56 54.46	21 34 32.2	5.2	5.0	0.36	8	0 36	23 38 2.24	3 53 27.3	5.2	5.0	0.34
22	23 54	20 2 14.03	21 21 27.7	5.2	5.0	0.36	9	0 36	23 42 36.47	3 23 10.7	5.2	5.0	0.34
23	23 55	20 7 32.59	21 7 44.8	5.2	5.0	0.36	10	0 37	23 47 10.30	2 52 48.6	5.2	5.0	0.34
24	23 56	20 12 50.09	20 53 24.0	5.2	5.0	0.36	11	0 38	23 51 43.78	2 22 21.6	5.2	5.0	0.34
25	23 58	20 18 6.50	−20 38 25.7	5.2	5.0	0.36	12	0 38	23 56 16.95	− 1 51 50.4	5.2	5.0	0.34
26	23 59	20 23 21.80	20 22 50.7	5.2	5.0	0.36	13	0 39	0 0 49.85	1 21 15.8	5.2	5.0	0.34
28	0 0	20 28 35.97	20 6 39.5	5.1	5.0	0.36	14	0 39	0 5 22.52	0 50 38.4	5.2	5.0	0.34
29	0 1	20 33 48.97	19 49 52.9	5.1	5.0	0.35	15	0 40	0 9 55.01	− 0 19 59.0	5.2	5.0	0.34
30	0 3	20 39 0.78	19 32 31.5	5.1	5.0	0.35	16	0 41	0 14 27.37	+ 0 10 41.7	5.2	5.0	0.34
31	0 4	20 44 11.38	−19 14 35.9	5.1	5.0	0.35	17	0 41	0 18 59.65	+ 0 41 23.1	5.2	5.0	0.34
Feb. 1	0 5	20 49 20.77	18 56 6.8	5.1	5.0	0.35	18	0 42	0 23 31.88	1 12 4.3	5.2	5.0	0.34
2	0 6	20 54 28.93	18 37 5.0	5.1	5.0	0.35	19	0 42	0 28 4.10	1 42 44.6	5.2	5.0	0.34
3	0 7	20 59 35.85	18 17 31.1	5.1	5.0	0.35	20	0 43	0 32 36.36	2 13 23.3	5.2	5.0	0.34
4	0 8	21 4 41.52	17 57 25.9	5.1	5.0	0.35	21	0 44	0 37 8.71	2 43 59.6	5.2	5.0	0.34
5	0 10	21 9 45.95	−17 36 50.0	5.1	5.0	0.35	22	0 44	0 41 41.19	+ 3 14 32.8	5.2	5.1	0.34
6	0 11	21 14 49.12	17 15 44.3	5.1	5.0	0.35	23	0 45	0 46 13.83	3 45 2.2	5.2	5.1	0.34
7	0 12	21 19 51.03	16 54 9.4	5.1	5.0	0.35	24	0 45	0 50 46.68	4 15 27.1	5.2	5.1	0.34
8	0 13	21 24 51.70	16 32 6.1	5.1	5.0	0.35	25	0 46	0 55 19.77	4 45 46.6	5.2	5.1	0.34
9	0 14	21 29 51.14	16 9 35.1	5.1	5.0	0.35	26	0 47	0 59 53.14	5 16 0.0	5.2	5.1	0.34
10	0 15	21 34 49.35	−15 46 37.2	5.1	5.0	0.35	27	0 47	1 4 26.85	+ 5 46 6.7	5.2	5.1	0.34
11	0 16	21 39 46.34	15 23 13.0	5.1	5.0	0.35	28	0 48	1 9 0.94	6 16 5.8	5.3	5.1	0.34
12	0 17	21 44 42.13	14 59 23.4	5.1	5.0	0.35	29	0 48	1 13 35.43	6 45 56.5	5.3	5.1	0.34
13	0 18	21 49 36.74	14 35 9.1	5.1	5.0	0.35	30	0 49	1 18 10.36	7 15 38.2	5.3	5.1	0.34
14	0 19	21 54 30.18	14 10 30.9	5.1	5.0	0.35	31	0 50	1 22 45.77	7 45 10.1	5.3	5.1	0.34
15	0 20	21 59 22.48	−13 45 29.4	5.1	5.0	0.34	Apr. 1	0 50	1 27 21.69	+ 8 14 31.5	5.3	5.1	0.35
16	0 21	22 4 13.65	−13 20 5.4	5.1	5.0	0.34	2	0 51	1 31 58.17	+ 8 43 41.5	5.3	5.1	0.35

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	0 50	1 27 21.69	+ 8 14 31.5	5.3	5.1	0.35	May 16	1 35	5 9 45.36	+23 54 50.7	5.8	5.6	0.41
2	0 51	1 31 58.17	8 43 41.5	5.3	5.1	0.35	17	1 36	5 15 3.03	24 3 9.7	5.8	5.6	0.41
3	0 52	1 36 35.25	9 12 39.5	5.3	5.1	0.35	18	1 38	5 20 21.22	24 10 47.2	5.8	5.6	0.41
4	0 52	1 41 12.95	9 41 24.7	5.3	5.1	0.35	19	1 39	5 25 39.87	24 17 42.9	5.8	5.7	0.41
5	0 53	1 45 51.31	10 9 56.3	5.3	5.1	0.35	20	1 41	5 30 58.93	24 23 56.6	5.9	5.7	0.42
6	0 54	1 50 30.37	+10 38 13.6	5.3	5.1	0.35	21	1 42	5 36 18.35	+24 29 27.9	5.9	5.7	0.42
7	0 54	1 55 10.15	11 6 16.0	5.3	5.2	0.35	22	1 43	5 41 38.05	24 34 16.6	5.9	5.7	0.42
8	0 55	1 59 50.70	11 34 2.6	5.3	5.2	0.35	23	1 45	5 46 57.98	24 38 22.5	5.9	5.7	0.42
9	0 56	2 4 32.05	12 1 32.6	5.3	5.2	0.35	24	1 46	5 52 18.08	24 41 45.4	5.9	5.8	0.42
10	0 57	2 9 14.22	12 28 45.4	5.3	5.2	0.35	25	1 48	5 57 38.28	24 44 25.3	5.9	5.8	0.42
11	0 58	2 13 57.25	+12 55 40.2	5.3	5.2	0.36	26	1 49	6 2 58.52	+24 46 22.0	6.0	5.8	0.43
12	0 58	2 18 41.17	13 22 16.4	5.4	5.2	0.36	27	1 50	6 8 18.73	24 47 35.4	6.0	5.8	0.43
13	0 59	2 23 26.02	13 48 33.1	5.4	5.2	0.36	28	1 52	6 13 38.84	24 48 5.5	6.0	5.8	0.43
14	1 0	2 28 11.82	14 14 29.7	5.4	5.2	0.36	29	1 53	6 18 58.78	24 47 52.3	6.0	5.9	0.43
15	1 1	2 32 58.59	14 40 5.3	5.4	5.2	0.36	30	1 54	6 24 18.49	24 46 55.8	6.1	5.9	0.43
16	1 2	2 37 46.35	+15 5 19.3	5.4	5.2	0.36	31	1 56	6 29 37.90	+24 45 16.1	6.1	5.9	0.43
17	1 2	2 42 35.14	15 30 10.9	5.4	5.2	0.36	June 1	1 57	6 34 56.94	24 42 53.3	6.1	5.9	0.43
18	1 3	2 47 24.97	15 54 39.3	5.4	5.3	0.37	2	1 59	6 40 15.54	24 39 47.5	6.1	5.9	0.44
19	1 4	2 52 15.85	16 18 43.8	5.4	5.3	0.37	3	2 0	6 45 33.64	24 35 59.0	6.1	6.0	0.44
20	1 5	2 57 7.80	16 42 23.6	5.4	5.3	0.37	4	2 1	6 50 51.19	24 31 28.0	6.2	6.0	0.44
21	1 6	3 2 0.83	+17 5 38.0	5.4	5.3	0.37	5	2 3	6 56 8.12	+24 26 14.5	6.2	6.0	0.44
22	1 7	3 6 54.96	17 28 26.2	5.5	5.3	0.37	6	2 4	7 1 24.37	24 20 18.9	6.2	6.0	0.44
23	1 8	3 11 50.19	17 50 47.5	5.5	5.3	0.37	7	2 5	7 6 39.89	24 13 41.5	6.2	6.1	0.44
24	1 9	3 16 46.53	18 12 41.1	5.5	5.3	0.37	8	2 7	7 11 54.63	24 6 22.6	6.3	6.1	0.45
25	1 10	3 21 43.97	18 34 6.4	5.5	5.3	0.37	9	2 8	7 17 8.53	23 58 22.6	6.3	6.1	0.45
26	1 11	3 26 42.52	+18 55 2.5	5.5	5.3	0.38	10	2 9	7 22 21.54	+23 49 41.7	6.3	6.1	0.45
27	1 12	3 31 42.18	19 15 28.7	5.5	5.3	0.38	11	2 10	7 27 33.61	23 40 20.4	6.4	6.2	0.45
28	1 13	3 36 42.95	19 35 24.4	5.5	5.4	0.38	12	2 12	7 32 44.69	23 30 19.1	6.4	6.2	0.45
29	1 14	3 41 44.81	19 54 48.9	5.5	5.4	0.38	13	2 13	7 37 54.75	23 19 38.2	6.4	6.2	0.45
30	1 15	3 46 47.76	20 13 41.4	5.5	5.4	0.38	14	2 14	7 43 3.75	23 8 18.1	6.4	6.2	0.45
May 1	1 16	3 51 51.77	+20 32 1.3	5.5	5.4	0.38	15	2 15	7 48 11.63	+22 56 19.2	6.5	6.3	0.45
2	1 18	3 56 56.84	20 49 47.8	5.6	5.4	0.39	16	2 16	7 53 18.36	22 43 42.2	6.5	6.3	0.46
3	1 19	4 2 2.96	21 7 0.4	5.6	5.4	0.39	17	2 18	7 58 23.90	22 30 27.5	6.5	6.3	0.46
4	1 20	4 7 10.09	21 23 38.4	5.6	5.4	0.39	18	2 19	8 3 28.21	22 16 35.7	6.5	6.4	0.46
5	1 21	4 12 18.22	21 39 41.2	5.6	5.5	0.39	19	2 20	8 8 31.28	22 2 7.3	6.6	6.4	0.46
6	1 22	4 17 27.32	+21 55 8.2	5.6	5.5	0.39	20	2 21	8 13 33.07	+21 47 2.9	6.6	6.4	0.46
7	1 24	4 22 37.37	22 9 58.8	5.6	5.5	0.39	21	2 22	8 18 33.54	21 31 23.1	6.6	6.4	0.46
8	1 25	4 27 48.35	22 24 12.4	5.6	5.5	0.40	22	2 23	8 23 32.67	21 15 8.6	6.7	6.5	0.46
9	1 26	4 33 0.22	22 37 48.6	5.7	5.5	0.40	23	2 24	8 28 30.43	20 58 19.9	6.7	6.5	0.46
10	1 27	4 38 12.95	22 50 46.8	5.7	5.5	0.40	24	2 25	8 33 26.81	20 40 57.6	6.7	6.5	0.47
11	1 29	4 43 26.51	+23 3 6.5	5.7	5.5	0.40	25	2 26	8 38 21.77	+20 23 2.4	6.8	6.6	0.47
12	1 30	4 48 40.86	23 14 47.2	5.7	5.5	0.40	26	2 27	8 43 15.31	20 4 35.1	6.8	6.6	0.47
13	1 31	4 53 55.96	23 25 48.4	5.7	5.6	0.40	27	2 28	8 48 7.42	19 45 36.3	6.8	6.6	0.47
14	1 33	4 59 11.77	23 36 9.6	5.8	5.6	0.41	28	2 29	8 52 58.07	19 26 6.7	6.9	6.7	0.47
15	1 34	5 4 28.26	23 45 50.5	5.8	5.6	0.41	29	2 30	8 57 47.25	19 6 6.9	6.9	6.7	0.47
16	1 35	5 9 45.36	+23 54 50.7	5.8	5.6	0.41	30	2 30	9 2 34.95	+18 45 37.7	6.9	6.7	0.47
17	1 36	5 15 3.03	+24 3 9.7	5.8	5.6	0.41	July 1	2 31	9 7 21.17	+18 24 39.8	7.0	6.8	0.48

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	2 31	9 7 21.17	+18 24 39.8	7.0	6.8	0.48	Aug. 16	2 47	12 24 28.95	− 2 54 28.5	9.5	9.2	0.62
2	2 32	9 12 5.91	18 3 14.0	7.0	6.8	0.48	17	2 47	12 28 26.02	3 24 53.8	9.6	9.3	0.62
3	2 33	9 16 49.17	17 41 21.0	7.0	6.8	0.48	18	2 47	12 32 22.66	3 55 15.7	9.6	9.4	0.63
4	2 34	9 21 30.95	17 19 1.5	7.1	6.9	0.48	19	2 47	12 36 18.90	4 25 33.6	9.7	9.4	0.63
5	2 34	9 26 11.25	16 56 16.2	7.1	6.9	0.48	20	2 47	12 40 14.75	4 55 46.9	9.8	9.5	0.64
6	2 35	9 30 50.08	+16 33 5.7	7.2	6.9	0.48	21	2 47	12 44 10.23	− 5 25 55.0	9.9	9.6	0.64
7	2 36	9 35 27.45	16 9 30.8	7.2	7.0	0.49	22	2 47	12 48 5.36	5 55 57.1	10.0	9.7	0.65
8	2 36	9 40 3.37	15 45 32.3	7.2	7.0	0.49	23	2 47	12 52 0.14	6 25 52.6	10.1	9.8	0.66
9	2 37	9 44 37.86	15 21 10.8	7.3	7.1	0.49	24	2 47	12 55 54.59	6 55 40.9	10.2	9.9	0.66
10	2 38	9 49 10.93	14 56 27.0	7.3	7.1	0.49	25	2 47	12 59 48.72	7 25 21.5	10.3	10.0	0.67
11	2 38	9 53 42.60	+14 31 21.6	7.4	7.1	0.49	26	2 47	13 3 42.53	− 7 54 53.7	10.4	10.1	0.68
12	2 39	9 58 12.90	14 5 55.4	7.4	7.2	0.50	27	2 47	13 7 36.02	8 24 16.8	10.4	10.1	0.68
13	2 39	10 2 41.85	13 40 8.9	7.5	7.2	0.50	28	2 47	13 11 29.21	8 53 30.1	10.5	10.2	0.69
14	2 40	10 7 9.45	13 14 2.8	7.5	7.3	0.50	29	2 47	13 15 22.09	9 22 33.1	10.6	10.3	0.70
15	2 40	10 11 35.73	12 47 37.9	7.5	7.3	0.50	30	2 47	13 19 14.68	9 51 25.1	10.7	10.4	0.70
16	2 41	10 16 0.72	+12 20 55.0	7.6	7.4	0.50	31	2 46	13 23 6.97	−10 20 5.5	10.8	10.5	0.71
17	2 41	10 20 24.43	11 53 54.7	7.6	7.4	0.51	Sept. 1	2 46	13 26 58.96	10 48 33.9	11.0	10.6	0.72
18	2 42	10 24 46.90	11 26 37.6	7.7	7.5	0.51	2	2 46	13 30 50.66	11 16 49.6	11.1	10.7	0.73
19	2 42	10 29 8.14	10 59 4.5	7.7	7.5	0.51	3	2 46	13 34 42.06	11 44 52.0	11.2	10.8	0.74
20	2 42	10 33 28.18	10 31 16.0	7.8	7.6	0.51	4	2 46	13 38 33.14	12 12 40.4	11.3	10.9	0.75
21	2 43	10 37 47.05	+10 3 12.9	7.8	7.6	0.52	5	2 46	13 42 23.91	−12 40 14.5	11.4	11.1	0.76
22	2 43	10 42 4.77	9 34 56.0	7.9	7.7	0.52	6	2 46	13 46 14.37	13 7 33.6	11.5	11.2	0.77
23	2 44	10 46 21.36	9 6 25.8	7.9	7.7	0.52	7	2 46	13 50 4.52	13 34 37.2	11.6	11.3	0.78
24	2 44	10 50 36.84	8 37 43.0	8.0	7.8	0.52	8	2 46	13 53 54.34	14 1 24.8	11.7	11.4	0.79
25	2 44	10 54 51.24	8 8 48.3	8.0	7.8	0.53	9	2 46	13 57 43.82	14 27 55.8	11.9	11.5	0.80
26	2 44	10 59 4.60	+ 7 39 42.5	8.1	7.9	0.53	10	2 46	14 1 32.93	−14 54 9.6	12.0	11.7	0.81
27	2 45	11 3 16.93	7 10 26.3	8.1	7.9	0.53	11	2 45	14 5 21.66	15 20 5.7	12.1	11.8	0.82
28	2 45	11 7 28.26	6 41 0.5	8.2	8.0	0.54	12	2 45	14 9 9.99	15 45 43.6	12.3	11.9	0.83
29	2 45	11 11 38.60	6 11 25.6	8.3	8.0	0.54	13	2 45	14 12 57.90	16 11 2.7	12.4	12.0	0.84
30	2 45	11 15 47.98	5 41 42.3	8.3	8.1	0.54	14	2 45	14 16 45.35	16 36 2.4	12.5	12.2	0.85
31	2 46	11 19 56.43	+ 5 11 51.3	8.4	8.1	0.55	15	2 45	14 20 32.32	−17 0 42.3	12.7	12.3	0.86
Aug. 1	2 46	11 24 3.99	4 41 53.3	8.4	8.2	0.55	16	2 45	14 24 18.76	17 25 1.9	12.8	12.5	0.87
2	2 46	11 28 10.67	4 11 48.9	8.5	8.3	0.55	17	2 44	14 28 4.64	17 49 0.6	13.0	12.6	0.88
3	2 46	11 32 16.51	3 41 38.9	8.6	8.3	0.56	18	2 44	14 31 49.91	18 12 37.9	13.1	12.7	0.89
4	2 46	11 36 21.53	3 11 23.8	8.6	8.4	0.56	19	2 44	14 35 34.52	18 35 53.1	13.3	12.9	0.91
5	2 46	11 40 25.77	+ 2 41 4.3	8.7	8.4	0.56	20	2 44	14 39 18.40	−18 58 45.8	13.4	13.0	0.92
6	2 46	11 44 29.25	2 10 41.0	8.8	8.5	0.57	21	2 44	14 43 1.50	19 21 15.5	13.6	13.2	0.93
7	2 47	11 48 32.00	1 40 14.5	8.8	8.6	0.57	22	2 44	14 46 43.73	19 43 21.5	13.8	13.4	0.95
8	2 47	11 52 34.05	1 9 45.4	8.9	8.6	0.58	23	2 43	14 50 25.03	20 5 3.4	13.9	13.5	0.96
9	2 47	11 56 35.44	0 39 14.4	9.0	8.7	0.58	24	2 43	14 54 5.31	20 26 20.6	14.1	13.7	0.97
10	2 47	12 0 36.20	+ 0 8 41.9	9.0	8.8	0.59	25	2 43	14 57 44.48	−20 47 12.6	14.3	13.9	0.99
11	2 47	12 4 36.35	− 0 21 51.4	9.1	8.8	0.59	26	2 42	15 1 22.45	21 7 38.9	14.5	14.1	1.00
12	2 47	12 8 35.92	0 52 24.9	9.2	8.9	0.60	27	2 42	15 4 59.12	21 27 39.1	14.7	14.2	1.02
13	2 47	12 12 34.94	1 22 57.9	9.2	9.0	0.60	28	2 42	15 8 34.38	21 47 12.6	14.9	14.4	1.03
14	2 47	12 16 33.44	1 53 30.0	9.3	9.0	0.61	29	2 41	15 12 8.13	22 6 19.0	15.0	14.6	1.05
15	2 47	12 20 31.43	− 2 24 0.4	9.4	9.1	0.61	30	2 41	15 15 40.26	−22 24 58.0	15.2	14.8	1.07
16	2 47	12 24 28.95	− 2 54 28.5	9.5	9.2	0.62	Oct. 1	2 40	15 19 10.65	−22 43 9.1	15.4	15.0	1.08

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	2 40	15 19 10.65	−22 43 9.1	15.4	15.0	1.08	Nov. 16	0 53	16 32 37.09	−26 9 47.0	31.0	30.1	2.24
2	2 40	15 22 39.18	23 0 51.9	15.6	15.2	1.10	17	0 47	16 30 59.68	25 56 5.5	31.3	30.4	2.26
3	2 39	15 26 5.72	23 18 6.0	15.9	15.4	1.12	18	0 42	16 29 14.15	25 41 25.4	31.6	30.7	2.27
4	2 39	15 29 30.13	23 34 51.1	16.1	15.6	1.14	19	0 36	16 27 21.10	25 25 47.9	31.9	31.0	2.29
5	2 38	15 32 52.28	23 51 6.6	16.3	15.8	1.15	20	0 30	16 25 21.22	25 9 14.4	32.2	31.3	2.30
6	2 38	15 36 12.02	−24 6 52.3	16.5	16.1	1.17	21	0 24	16 23 15.28	−24 51 47.2	32.4	31.5	2.31
7	2 37	15 39 29.19	24 22 8.0	16.8	16.3	1.19	22	0 18	16 21 4.10	24 33 29.2	32.6	31.7	2.32
8	2 36	15 42 43.64	24 36 53.2	17.0	16.5	1.21	23	0 12	16 18 48.56	24 14 24.0	32.8	31.9	2.33
9	2 36	15 45 55.20	24 51 7.6	17.3	16.8	1.23	24	0 5	16 16 29.61	23 54 35.7	32.9	32.0	2.33
10	2 35	15 49 3.70	25 4 50.9	17.5	17.0	1.25	24	23 59	16 14 8.27	23 34 9.3	33.0	32.1	2.33
11	2 34	15 52 8.95	−25 18 2.8	17.8	17.3	1.27	25	23 53	16 11 45.56	−23 13 10.0	33.1	32.2	2.33
12	2 33	15 55 10.76	25 30 43.0	18.1	17.5	1.29	26	23 46	16 9 22.51	22 51 43.7	33.2	32.2	2.33
13	2 32	15 58 8.94	25 42 51.0	18.3	17.8	1.32	27	23 40	16 7 0.16	22 29 56.9	33.2	32.2	2.32
14	2 31	16 1 3.28	25 54 26.6	18.6	18.1	1.34	28	23 34	16 4 39.55	22 7 56.3	33.1	32.2	2.31
15	2 30	16 3 53.56	26 5 29.5	18.9	18.4	1.36	29	23 28	16 2 21.67	21 45 48.8	33.0	32.1	2.30
16	2 29	16 6 39.57	−26 15 59.3	19.2	18.6	1.39	30	23 21	16 0 7.49	−21 23 41.6	32.9	32.0	2.29
17	2 28	16 9 21.05	26 25 55.6	19.5	18.9	1.41	Dec. 1	23 15	15 57 57.91	21 1 41.7	32.8	31.8	2.27
18	2 26	16 11 57.76	26 35 18.1	19.8	19.2	1.43	2	23 9	15 55 53.79	20 39 56.3	32.6	31.6	2.25
19	2 25	16 14 29.45	26 44 6.4	20.1	19.5	1.46	3	23 3	15 53 55.91	20 18 32.0	32.4	31.4	2.23
20	2 23	16 16 55.83	26 52 20.0	20.4	19.9	1.48	4	22 58	15 52 4.97	19 57 35.4	32.1	31.2	2.21
21	2 22	16 19 16.62	−26 59 58.4	20.8	20.2	1.51	5	22 52	15 50 21.58	−19 37 12.5	31.8	30.9	2.19
22	2 20	16 21 31.53	27 7 1.1	21.1	20.5	1.54	6	22 46	15 48 46.28	19 17 28.9	31.6	30.6	2.17
23	2 18	16 23 40.28	27 13 27.7	21.5	20.8	1.56	7	22 41	15 47 19.55	18 58 29.6	31.3	30.3	2.14
24	2 16	16 25 42.54	27 19 17.6	21.8	21.2	1.59	8	22 36	15 46 1.78	18 40 19.0	30.9	30.0	2.11
25	2 14	16 27 38.00	27 24 30.0	22.2	21.5	1.62	9	22 31	15 44 53.26	18 23 0.9	30.5	29.7	2.09
26	2 12	16 29 26.36	−27 29 4.4	22.6	21.9	1.65	10	22 26	15 43 54.19	−18 6 38.6	30.2	29.3	2.06
27	2 10	16 31 7.30	27 33 0.1	22.9	22.3	1.68	11	22 21	15 43 4.73	17 51 14.7	29.8	28.9	2.03
28	2 8	16 32 40.51	27 36 16.4	23.3	22.6	1.70	12	22 16	15 42 24.98	17 36 51.1	29.4	28.5	2.00
29	2 5	16 34 5.70	27 38 52.4	23.7	23.0	1.73	13	22 12	15 41 54.97	17 23 29.3	29.0	28.1	1.97
30	2 2	16 35 22.56	27 40 47.2	24.1	23.4	1.76	14	22 8	15 41 34.67	17 11 10.2	28.5	27.7	1.94
31	2 0	16 36 30.80	−27 41 59.9	24.5	23.8	1.79	15	22 4	15 41 24.02	−16 59 54.3	28.1	27.3	1.91
Nov. 1	1 57	16 37 30.14	27 42 29.5	24.9	24.2	1.82	16	22 0	15 41 22.90	16 49 41.5	27.7	26.9	1.88
2	1 54	16 38 20.30	27 42 15.0	25.3	24.6	1.85	17	21 56	15 41 31.19	16 40 31.4	27.3	26.5	1.85
3	1 50	16 39 1.04	27 41 15.0	25.7	25.0	1.88	18	21 52	15 41 48.73	16 32 23.2	26.9	26.1	1.82
4	1 47	16 39 32.13	27 39 28.4	26.2	25.4	1.91	19	21 49	15 42 15.35	16 25 16.1	26.5	25.7	1.79
5	1 43	16 39 53.35	−27 36 54.0	26.6	25.8	1.94	20	21 46	15 42 50.86	−16 19 8.8	26.0	25.3	1.76
6	1 40	16 40 4.54	27 33 30.5	27.0	26.2	1.97	21	21 42	15 43 35.07	16 13 59.8	25.6	24.9	1.73
7	1 36	16 40 5.55	27 29 16.4	27.4	26.6	2.00	22	21 39	15 44 27.78	16 9 47.4	25.2	24.5	1.70
8	1 32	16 39 56.29	27 24 10.3	27.8	27.0	2.03	23	21 36	15 45 28.77	16 6 29.8	24.8	24.1	1.67
9	1 27	16 39 36.70	27 18 10.9	28.3	27.5	2.06	24	21 34	15 46 37.83	16 4 5.0	24.4	23.7	1.64
10	1 23	16 39 6.77	−27 11 16.9	28.7	27.9	2.09	25	21 31	15 47 54.74	−16 2 31.0	24.0	23.3	1.62
11	1 18	16 38 26.54	27 3 27.1	29.1	28.3	2.12	26	21 28	15 49 19.26	16 1 45.6	23.6	22.9	1.59
12	1 13	16 37 36.13	26 54 40.3	29.5	28.7	2.14	27	21 26	15 50 51.19	16 1 46.5	23.2	22.5	1.56
13	1 8	16 36 35.71	26 44 55.4	29.9	29.0	2.17	28	21 24	15 52 30.30	16 2 31.4	22.8	22.1	1.54
14	1 3	16 35 25.51	26 34 11.9	30.3	29.4	2.19	29	21 22	15 54 16.39	16 3 58.1	22.4	21.8	1.51
15	0 58	16 34 5.85	−26 22 29.2	30.7	29.8	2.22	30	21 20	15 56 9.24	−16 6 4.3	22.1	21.4	1.49
16	0 53	16 32 37.09	−26 9 47.0	31.0	30.1	2.24	31	21 18	15 58 8.65	−16 8 47.4	21.7	21.1	1.46

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 1	12 28	7 11 35.34	+26 19 22.1	14.1	8.1	0.60
2	12 22	7 9 50.65	26 23 38.5	14.1	8.1	0.60
3	12 16	7 8 5.61	26 27 44.9	14.1	8.1	0.60
4	12 10	7 6 20.45	26 31 41.1	14.1	8.1	0.60
5	12 5	7 4 35.37	26 35 26.6	14.1	8.1	0.60
6	11 59	7 2 50.59	+26 39 1.1	14.1	8.1	0.60
7	11 53	7 1 6.33	26 42 24.2	14.1	8.1	0.60
8	11 48	6 59 22.80	26 45 35.9	14.1	8.1	0.59
9	11 42	6 57 40.20	26 48 35.9	14.0	8.1	0.59
10	11 36	6 55 58.75	26 51 24.0	13.9	8.1	0.59
11	11 31	6 54 18.64	+26 54 0.2	13.9	8.0	0.59
12	11 25	6 52 40.05	26 56 24.6	13.9	8.0	0.59
13	11 20	6 51 3.14	26 58 37.2	13.8	7.8	0.58
14	11 14	6 49 28.11	27 0 38.2	13.8	7.8	0.58
15	11 9	6 47 55.13	27 2 27.6	13.7	7.8	0.58
16	11 3	6 46 24.35	+27 4 5.7	13.6	7.8	0.58
17	10 58	6 44 55.92	27 5 32.7	13.5	7.7	0.58
18	10 53	6 43 29.99	27 6 48.9	13.5	7.7	0.57
19	10 47	6 42 6.70	27 7 54.5	13.4	7.6	0.57
20	10 42	6 40 46.18	27 8 49.8	13.3	7.6	0.57
21	10 37	6 39 28.55	+27 9 35.1	13.2	7.6	0.56
22	10 32	6 38 13.95	27 10 10.8	13.1	7.5	0.56
23	10 26	6 37 2.48	27 10 37.1	13.0	7.5	0.55
24	10 21	6 35 54.22	27 10 54.5	12.9	7.4	0.55
25	10 16	6 34 49.27	27 11 3.4	12.8	7.4	0.55
26	10 12	6 33 47.70	+27 11 4.1	12.7	7.3	0.54
27	10 7	6 32 49.56	27 10 57.1	12.6	7.2	0.54
28	10 1	6 31 54.88	27 10 42.7	12.5	7.2	0.54
29	9 57	6 31 3.81	27 10 21.2	12.4	7.1	0.53
30	9 52	6 30 16.30	27 9 53.2	12.3	7.0	0.53
31	9 48	6 29 32.39	+27 9 19.1	12.2	7.0	0.52
Feb. 1	9 43	6 28 52.10	27 8 39.1	12.1	6.9	0.52
2	9 38	6 28 15.42	27 7 53.5	12.0	6.9	0.52
3	9 34	6 27 42.35	27 7 2.6	11.9	6.8	0.51
4	9 30	6 27 12.90	27 6 6.7	11.8	6.8	0.51
5	9 25	6 26 47.03	+27 5 6.2	11.7	6.7	0.50
6	9 21	6 26 24.73	27 4 1.4	11.6	6.6	0.49
7	9 17	6 26 5.98	27 2 52.5	11.5	6.6	0.49
8	9 12	6 25 50.74	27 1 39.8	11.4	6.5	0.49
9	9 8	6 25 38.98	27 0 23.5	11.3	6.5	0.48
10	9 4	6 25 30.65	+26 59 3.9	11.2	6.4	0.48
11	9 0	6 25 25.71	26 57 41.2	11.1	6.4	0.47
12	8 56	6 25 24.13	26 56 15.7	11.0	6.3	0.47
13	8 52	6 25 25.85	26 54 47.2	10.9	6.3	0.46
14	8 48	6 25 30.82	26 53 15.8	10.8	6.2	0.46
15	8 45	6 25 39.01	+26 51 41.8	10.7	6.1	0.46
Feb. 15	8 45	6 25 39.01	+26 51 41.8	10.7	6.1	0.46
16	8 41	6 25 50.36	26 50 5.3	10.6	6.1	0.46
17	8 37	6 26 4.83	26 48 26.5	10.5	6.0	0.45
18	8 34	6 26 22.40	26 46 45.4	10.4	5.9	0.44
19	8 30	6 26 43.00	26 45 1.9	10.3	5.9	0.44
20	8 27	6 27 6.59	+26 43 16.2	10.2	5.8	0.43
21	8 23	6 27 33.12	26 41 28.2	10.1	5.8	0.43
22	8 20	6 28 2.54	26 39 37.9	10.0	5.7	0.43
23	8 16	6 28 34.80	26 37 45.3	9.9	5.7	0.42
24	8 13	6 29 9.84	26 35 50.4	9.8	5.6	0.42
25	8 10	6 29 47.61	+26 33 53.2	9.7	5.6	0.41
26	8 6	6 30 28.05	26 31 53.7	9.6	5.5	0.41
27	8 3	6 31 11.11	26 29 51.8	9.5	5.4	0.41
28	8 0	6 31 56.74	26 27 47.5	9.4	5.4	0.40
Mar. 1	7 57	6 32 44.88	26 25 40.7	9.3	5.3	0.40
2	7 54	6 33 35.47	+26 23 31.3	9.2	5.3	0.39
3	7 51	6 34 28.44	26 21 19.3	9.1	5.2	0.39
4	7 48	6 35 23.75	26 19 4.6	9.0	5.2	0.39
5	7 45	6 36 21.34	26 16 47.2	8.9	5.1	0.38
6	7 42	6 37 21.14	26 14 26.9	8.9	5.1	0.38
7	7 39	6 38 23.10	+26 12 3.8	8.8	5.1	0.37
8	7 36	6 39 27.16	26 9 37.7	8.7	5.0	0.37
9	7 33	6 40 33.28	26 7 8.5	8.6	4.9	0.37
10	7 30	6 41 41.40	26 4 36.2	8.5	4.9	0.36
11	7 28	6 42 51.45	26 2 0.7	8.5	4.8	0.36
12	7 25	6 44 3.39	+25 59 21.7	8.4	4.8	0.36
13	7 22	6 45 17.16	25 56 39.3	8.3	4.8	0.35
14	7 19	6 46 32.73	25 53 53.4	8.3	4.7	0.35
15	7 17	6 47 50.06	25 51 4.0	8.2	4.7	0.35
16	7 14	6 49 9.09	25 48 10.8	8.2	4.7	0.35
17	7 12	6 50 29.78	+25 45 13.8	8.1	4.6	0.34
18	7 9	6 51 52.10	25 42 12.8	8.1	4.6	0.34
19	7 6	6 53 16.02	25 39 7.7	8.0	4.6	0.34
20	7 4	6 54 41.50	25 35 58.5	7.9	4.5	0.33
21	7 1	6 56 8.51	25 32 45.0	7.8	4.5	0.33
22	6 59	6 57 37.00	+25 29 27.2	7.8	4.4	0.33
23	6 56	6 59 6.95	25 26 4.8	7.7	4.4	0.33
24	6 54	7 0 38.31	25 22 37.8	7.6	4.4	0.33
25	6 52	7 2 11.03	25 19 6.1	7.6	4.3	0.32
26	6 49	7 3 45.07	25 15 29.6	7.5	4.3	0.32
27	6 47	7 5 20.43	+25 11 48.2	7.4	4.2	0.31
28	6 45	7 6 57.07	25 8 1.8	7.4	4.2	0.31
29	6 42	7 8 34.96	25 4 10.3	7.3	4.2	0.30
30	6 40	7 10 14.06	25 0 13.6	7.2	4.1	0.30
31	6 38	7 11 54.33	24 56 11.7	7.2	4.1	0.30
Apr. 1	6 36	7 13 35.72	+24 52 4.5	7.1	4.1	0.30

Stellar magnitude at opposition, in January, 1914, −1.3

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
May 1	18 52	21 29 57.65	−15 27 33.6	1.7	18.3	1.35	June 16	16 0	21 39 29.75	−14 52 33.5	2.0	21.1	1.56
2	18 48	21 30 25.07	15 25 35.4	1.7	18.3	1.35	17	15 56	21 39 25.24	14 53 12.2	2.0	21.2	1.56
3	18 45	21 30 51.90	15 23 39.7	1.7	18.4	1.36	18	15 52	21 39 19.98	14 53 54.6	2.0	21.2	1.56
4	18 41	21 31 18.13	15 21 46.7	1.7	18.4	1.36	19	15 48	21 39 13.97	14 54 40.7	2.0	21.3	1.57
5	18 38	21 31 43.76	15 19 56.5	1.7	18.5	1.36	20	15 44	21 39 7.23	14 55 30.5	2.0	21.4	1.57
6	18 34	21 32 8.78	−15 18 9.3	1.7	18.6	1.37	21	15 40	21 38 59.74	−14 56 24.0	2.0	21.4	1.58
7	18 31	21 32 33.18	15 16 24.9	1.7	18.6	1.37	22	15 36	21 38 51.52	14 57 21.1	2.0	21.5	1.58
8	18 27	21 32 56.96	15 14 43.4	1.7	18.7	1.38	23	15 32	21 38 42.56	14 58 21.7	2.0	21.6	1.59
9	18 24	21 33 20.12	15 13 4.8	1.8	18.7	1.38	24	15 28	21 38 32.87	14 59 25.9	2.0	21.6	1.59
10	18 20	21 33 42.64	15 11 29.3	1.8	18.8	1.39	25	15 24	21 38 22.46	15 0 33.7	2.0	21.7	1.60
11	18 16	21 34 4.53	−15 9 56.7	1.8	18.8	1.39	26	15 20	21 38 11.34	−15 1 45.0	2.0	21.7	1.60
12	18 13	21 34 25.79	15 8 27.2	1.8	18.9	1.40	27	15 16	21 37 59.50	15 2 59.7	2.0	21.8	1.60
13	18 9	21 34 46.40	15 7 0.8	1.8	19.0	1.40	28	15 12	21 37 46.96	15 4 17.7	2.0	21.8	1.61
14	18 6	21 35 6.35	15 5 37.5	1.8	19.0	1.40	29	15 7	21 37 33.72	15 5 39.1	2.0	21.9	1.61
15	18 2	21 35 25.65	15 4 17.5	1.8	19.1	1.41	30	15 3	21 37 19.79	15 7 3.7	2.0	22.0	1.62
16	17 59	21 35 44.29	−15 3 0.7	1.8	19.1	1.41	July 1	14 59	21 37 5.18	−15 8 31.5	2.1	22.0	1.62
17	17 55	21 36 2.25	15 1 47.1	1.8	19.2	1.42	2	14 55	21 36 49.89	15 10 2.5	2.1	22.1	1.63
18	17 51	21 36 19.53	15 0 36.9	1.8	19.3	1.42	3	14 51	21 36 33.94	15 11 36.6	2.1	22.1	1.63
19	17 48	21 36 36.14	14 59 30.0	1.8	19.3	1.42	4	14 46	21 36 17.33	15 13 13.7	2.1	22.2	1.64
20	17 44	21 36 52.06	14 58 26.5	1.8	19.4	1.43	5	14 42	21 36 0.08	15 14 53.9	2.1	22.2	1.64
21	17 40	21 37 7.28	−14 57 26.4	1.8	19.4	1.43	6	14 38	21 35 42.19	−15 16 37.0	2.1	22.3	1.64
22	17 37	21 37 21.81	14 56 29.8	1.8	19.5	1.44	7	14 34	21 35 23.67	15 18 22.9	2.1	22.3	1.65
23	17 33	21 37 35.64	14 55 36.7	1.8	19.6	1.44	8	14 30	21 35 4.52	15 20 11.6	2.1	22.4	1.65
24	17 29	21 37 48.77	14 54 47.1	1.8	19.6	1.45	9	14 25	21 34 44.76	15 22 3.0	2.1	22.4	1.65
25	17 25	21 38 1.18	14 54 1.1	1.8	19.7	1.45	10	14 21	21 34 24.40	15 23 57.1	2.1	22.5	1.66
26	17 22	21 38 12.88	−14 53 18.6	1.8	19.8	1.46	11	14 17	21 34 3.44	−15 25 53.9	2.1	22.5	1.66
27	17 18	21 38 23.85	14 52 39.7	1.8	19.8	1.46	12	14 12	21 33 41.91	15 27 53.2	2.1	22.6	1.66
28	17 14	21 38 34.11	14 52 4.5	1.9	19.9	1.46	13	14 8	21 33 19.81	15 29 54.9	2.1	22.6	1.67
29	17 10	21 38 43.65	14 51 32.8	1.9	20.0	1.47	14	14 4	21 32 57.16	15 31 58.9	2.1	22.7	1.67
30	17 7	21 38 52.48	14 51 4.7	1.9	20.0	1.48	15	13 59	21 32 33.97	15 34 5.2	2.1	22.7	1.68
31	17 3	21 39 0.57	−14 50 40.3	1.9	20.1	1.48	16	13 55	21 32 10.26	−15 36 13.8	2.1	22.8	1.68
June 1	16 59	21 39 7.92	14 50 19.7	1.9	20.1	1.48	17	13 51	21 31 46.03	15 38 24.5	2.1	22.8	1.68
2	16 55	21 39 14.55	14 50 2.7	1.9	20.2	1.49	18	13 46	21 31 21.29	15 40 37.3	2.1	22.8	1.68
3	16 51	21 39 20.45	14 49 49.4	1.9	20.3	1.49	19	13 42	21 30 56.08	15 42 52.0	2.1	22.9	1.69
4	16 47	21 39 25.61	14 49 39.7	1.9	20.3	1.50	20	13 38	21 30 30.40	15 45 8.5	2.1	22.9	1.69
5	16 44	21 39 30.04	−14 49 33.6	1.9	20.4	1.50	21	13 33	21 30 4.28	−15 47 26.8	2.1	22.9	1.69
6	16 40	21 39 33.73	14 49 31.2	1.9	20.5	1.51	22	13 29	21 29 37.72	15 49 46.6	2.1	23.0	1.70
7	16 36	21 39 36.68	14 49 32.6	1.9	20.5	1.51	23	13 25	21 29 10.75	15 52 7.9	2.1	23.0	1.70
8	16 32	21 39 38.89	14 49 37.8	1.9	20.6	1.52	24	13 20	21 28 43.40	15 54 30.6	2.1	23.0	1.70
9	16 28	21 39 40.36	14 49 46.7	1.9	20.7	1.52	25	13 16	21 28 15.67	15 56 54.7	2.2	23.0	1.70
10	16 24	21 39 41.09	−14 49 59.3	1.9	20.7	1.53	26	13 11	21 27 47.58	−15 59 20.0	2.2	23.1	1.71
11	16 20	21 39 41.07	14 50 15.6	1.9	20.8	1.53	27	13 7	21 27 19.17	16 1 46.3	2.2	23.1	1.71
12	16 16	21 39 40.30	14 50 35.7	2.0	20.9	1.54	28	13 3	21 26 50.45	16 4 13.5	2.2	23.1	1.71
13	16 12	21 39 38.78	14 50 59.5	2.0	20.9	1.54	29	12 58	21 26 21.44	16 6 41.6	2.2	23.1	1.71
14	16 8	21 39 36.51	14 51 27.1	2.0	21.0	1.55	30	12 54	21 25 52.16	16 9 10.4	2.2	23.2	1.71
15	16 4	21 39 33.50	−14 51 58.4	2.0	21.0	1.55	31	12 49	21 25 22.62	−16 11 39.9	2.2	23.2	1.72
16	16 0	21 39 29.75	−14 52 33.5	2.0	21.1	1.56	Aug. 1	12 45	21 24 52.86	−16 14 9.9	2.2	23.2	1.72

Stellar magnitude at opposition, in August, 1914, −2.4.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Aug. 1	12 45	21 24 52.86	−16 14 9.9	2.2	23.2	1.72	Sept. 16	9 23	21 4 8.22	−17 49 50.6	2.1	22.3	1.66
2	12 41	21 24 22.88	16 16 40.3	2.2	23.2	1.72	17	9 19	21 3 51.40	17 50 59.8	2.1	22.2	1.65
3	12 36	21 23 52.72	16 19 11.0	2.2	23.2	1.72	18	9 15	21 3 35.27	17 52 5.8	2.1	22.2	1.65
4	12 32	21 23 22.39	16 21 41.9	2.2	23.2	1.72	19	9 11	21 3 19.84	17 53 8.6	2.1	22.1	1.65
5	12 27	21 22 51.92	16 24 12.8	2.2	23.3	1.72	20	9 7	21 3 5.13	17 54 8.1	2.1	22.1	1.64
6	12 23	21 22 21.33	−16 26 43.7	2.2	23.3	1.72	21	9 3	21 2 51.15	−17 55 4.2	2.1	22.0	1.64
7	12 18	21 21 50.62	16 29 14.6	2.2	23.3	1.72	22	8 58	21 2 37.90	17 55 57.0	2.1	21.9	1.64
8	12 14	21 21 19.83	16 31 45.3	2.2	23.3	1.72	23	8 54	21 2 25.40	17 56 46.3	2.0	21.9	1.63
9	12 9	21 20 48.99	16 34 15.7	2.2	23.3	1.72	24	8 50	21 2 13.64	17 57 32.2	2.0	21.8	1.63
10	12 5	21 20 18.12	16 36 45.6	2.2	23.3	1.72	25	8 46	21 2 2.64	17 58 14.8	2.0	21.8	1.62
11	12 1	21 19 47.23	−16 39 15.0	2.2	23.3	1.73	26	8 42	21 1 52.40	−17 58 54.1	2.0	21.7	1.62
12	11 56	21 19 16.33	16 41 43.8	2.2	23.3	1.73	27	8 38	21 1 42.93	17 59 29.8	2.0	21.6	1.61
13	11 52	21 18 45.44	16 44 11.7	2.2	23.3	1.73	28	8 34	21 1 34.23	18 0 2.1	2.0	21.6	1.61
14	11 47	21 18 14.61	16 46 38.7	2.2	23.3	1.73	29	8 30	21 1 26.32	18 0 31.0	2.0	21.5	1.60
15	11 43	21 17 43.87	16 49 4.8	2.2	23.3	1.73	30	8 26	21 1 19.18	18 0 56.4	2.0	21.5	1.60
16	11 38	21 17 13.23	−16 51 29.9	2.2	23.3	1.72	Oct. 1	8 21	21 1 12.82	−18 1 18.4	2.0	21.4	1.60
17	11 34	21 16 42.69	16 53 54.0	2.2	23.3	1.72	2	8 17	21 1 7.24	18 1 37.0	2.0	21.4	1.59
18	11 29	21 16 12.30	16 56 16.9	2.2	23.2	1.72	3	8 13	21 1 2.45	18 1 52.2	2.0	21.3	1.59
19	11 25	21 15 42.07	16 58 38.4	2.2	23.2	1.72	4	8 9	21 0 58.46	18 2 3.9	2.0	21.2	1.58
20	11 21	21 15 12.04	17 0 58.4	2.2	23.2	1.72	5	8 5	21 0 55.26	18 2 12.2	2.0	21.2	1.58
21	11 16	21 14 42.23	−17 3 16.8	2.2	23.2	1.72	6	8 1	21 0 52.85	−18 2 17.0	2.0	21.1	1.57
22	11 12	21 14 12.66	17 5 33.5	2.2	23.2	1.72	7	7 58	21 0 51.23	18 2 18.4	2.0	21.0	1.57
23	11 7	21 13 43.34	17 7 48.4	2.2	23.2	1.72	8	7 54	21 0 50.40	18 2 16.4	2.0	21.0	1.56
24	11 3	21 13 14.29	17 10 1.4	2.2	23.1	1.72	9	7 50	21 0 50.37	18 2 11.0	2.0	20.9	1.56
25	10 58	21 12 45.55	17 12 12.6	2.2	23.1	1.72	10	7 46	21 0 51.15	18 2 2.2	2.0	20.8	1.55
26	10 54	21 12 17.15	−17 14 21.8	2.2	23.1	1.72	11	7 42	21 0 52.73	−18 1 50.0	1.9	20.8	1.55
27	10 50	21 11 49.10	17 16 28.8	2.2	23.1	1.71	12	7 38	21 0 55.11	18 1 34.3	1.9	20.7	1.54
28	10 45	21 11 21.41	17 18 33.6	2.2	23.0	1.71	13	7 34	21 0 58.28	18 1 15.2	1.9	20.6	1.54
29	10 41	21 10 54.10	17 20 36.1	2.2	23.0	1.71	14	7 30	21 1 2.25	18 0 52.8	1.9	20.6	1.53
30	10 36	21 10 27.19	17 22 36.3	2.1	23.0	1.71	15	7 26	21 1 7.01	18 0 26.8	1.9	20.5	1.53
31	10 32	21 10 0.72	−17 24 34.1	2.1	23.0	1.71	16	7 22	21 1 12.58	−17 59 57.4	1.9	20.4	1.52
Sept. 1	10 28	21 9 34.69	17 26 29.6	2.1	22.9	1.70	17	7 19	21 1 18.94	17 59 24.7	1.9	20.4	1.52
2	10 23	21 9 9.12	17 28 22.6	2.1	22.9	1.70	18	7 15	21 1 26.09	17 58 48.7	1.9	20.3	1.51
3	10 19	21 8 44.02	17 30 13.0	2.1	22.8	1.70	19	7 11	21 1 34.04	17 58 9.1	1.9	20.3	1.51
4	10 15	21 8 19.41	17 32 0.7	2.1	22.8	1.70	20	7 7	21 1 42.78	17 57 26.1	1.9	20.2	1.50
5	10 10	21 7 55.32	−17 33 45.7	2.1	22.8	1.69	21	7 3	21 1 52.31	−17 56 39.8	1.9	20.1	1.50
6	10 6	21 7 31.75	17 35 28.0	2.1	22.7	1.69	22	7 0	21 2 2.61	17 55 50.1	1.9	20.1	1.49
7	10 2	21 7 8.71	17 37 7.6	2.1	22.7	1.69	23	6 56	21 2 13.68	17 54 57.2	1.9	20.0	1.49
8	9 57	21 6 46.23	17 38 44.3	2.1	22.6	1.68	24	6 52	21 2 25.54	17 54 0.9	1.9	19.9	1.48
9	9 53	21 6 24.33	17 40 18.1	2.1	22.6	1.68	25	6 48	21 2 38.17	17 53 1.2	1.9	19.9	1.48
10	9 49	21 6 3.02	−17 41 49.0	2.1	22.6	1.68	26	6 45	21 2 51.56	−17 51 58.1	1.9	19.8	1.47
11	9 45	21 5 42.30	17 43 16.9	2.1	22.5	1.68	27	6 41	21 3 5.69	17 50 51.8	1.8	19.8	1.47
12	9 40	21 5 22.20	17 44 41.8	2.1	22.5	1.67	28	6 37	21 3 20.58	17 49 42.3	1.8	19.7	1.46
13	9 36	21 5 2.73	17 46 3.7	2.1	22.4	1.67	29	6 34	21 3 36.21	17 48 29.6	1.8	19.6	1.46
14	9 32	21 4 43.90	17 47 22.5	2.1	22.4	1.66	30	6 30	21 3 52.58	17 47 13.6	1.8	19.6	1.46
15	9 28	21 4 25.72	−17 48 38.2	2.1	22.3	1.66	31	6 26	21 4 9.68	−17 45 54.3	1.8	19.5	1.45
16	9 23	21 4 8.22	−17 49 50.6	2.1	22.3	1.66	Nov. 1	6 23	21 4 27.51	−17 44 31.8	1.8	19.4	1.45

Stellar magnitude at opposition, in August, 1914, −2.4.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	10 6	4 46 7.06	+20 40 33.9	1.1	9.5	0.74	Feb. 14	7 3	4 39 32.60	+20 38 36.4	1.0	8.9	0.69
1	10 2	4 45 49.78	20 40 14.1	1.1	9.5	0.74	15	6 59	4 39 34.20	20 38 54.5	1.0	8.9	0.69
2	9 58	4 45 32.78	20 39 54.7	1.1	9.5	0.74	16	6 55	4 39 36.28	20 39 13.6	1.0	8.9	0.69
3	9 54	4 45 16.09	20 39 36.0	1.1	9.5	0.74	17	6 51	4 39 38.83	20 39 33.5	1.0	8.9	0.69
4	9 50	4 44 59.72	20 39 17.9	1.1	9.5	0.74	18	6 47	4 39 41.86	20 39 54.3	1.0	8.8	0.69
5	9 45	4 44 43.67	+20 39 0.5	1.1	9.5	0.74	19	6 43	4 39 45.37	+20 40 16.1	1.0	8.8	0.69
6	9 41	4 44 27.94	20 38 43.7	1.1	9.5	0.74	20	6 40	4 39 49.36	20 40 38.8	1.0	8.8	0.68
7	9 37	4 44 12.55	20 38 27.6	1.1	9.4	0.74	21	6 36	4 39 53.81	20 41 2.4	1.0	8.8	0.68
8	9 33	4 43 57.49	20 38 12.3	1.1	9.4	0.74	22	6 32	4 39 58.73	20 41 26.9	1.0	8.8	0.68
9	9 29	4 43 42.78	20 37 57.6	1.1	9.4	0.73	23	6 28	4 40 4.13	20 41 52.3	1.0	8.8	0.68
10	9 25	4 43 28.43	+20 37 43.6	1.1	9.4	0.73	24	6 24	4 40 10.00	+20 42 18.5	1.0	8.8	0.68
11	9 20	4 43 14.44	20 37 30.4	1.1	9.4	0.73	25	6 20	4 40 16.35	20 42 45.5	1.0	8.8	0.68
12	9 16	4 43 0.82	20 37 18.0	1.1	9.4	0.73	26	6 17	4 40 23.17	20 43 13.4	1.0	8.7	0.68
13	9 12	4 42 47.58	20 37 6.3	1.1	9.4	0.73	27	6 13	4 40 30.45	20 43 42.1	1.0	8.7	0.68
14	9 8	4 42 34.72	20 36 55.3	1.1	9.4	0.73	28	6 9	4 40 38.19	20 44 11.6	1.0	8.7	0.68
15	9 4	4 42 22.24	+20 36 45.1	1.1	9.3	0.73	Mar. 1	6 5	4 40 46.39	+20 44 41.9	1.0	8.7	0.68
16	9 0	4 42 10.16	20 36 35.8	1.1	9.3	0.73	2	6 1	4 40 55.05	20 45 13.1	1.0	8.6	0.67
17	8 56	4 41 58.48	20 36 27.3	1.1	9.3	0.73	3	5 58	4 41 4.17	20 45 45.0	1.0	8.6	0.67
18	8 51	4 41 47.21	20 36 19.6	1.1	9.3	0.73	4	5 54	4 41 13.74	20 46 17.7	1.0	8.6	0.67
19	8 47	4 41 36.36	20 36 12.9	1.1	9.3	0.72	5	5 50	4 41 23.76	20 46 51.1	1.0	8.6	0.67
20	8 43	4 41 25.92	+20 36 7.0	1.1	9.3	0.72	6	5 46	4 41 34.21	+20 47 25.3	1.0	8.6	0.67
21	8 39	4 41 15.90	20 36 1.8	1.1	9.3	0.72	7	5 42	4 41 45.11	20 48 0.1	1.0	8.6	0.66
22	8 35	4 41 6.32	20 35 57.5	1.1	9.3	0.72	8	5 39	4 41 56.45	20 48 35.7	1.0	8.6	0.66
23	8 31	4 40 57.17	20 35 54.1	1.1	9.2	0.72	9	5 35	4 42 8.23	20 49 12.1	1.0	8.6	0.66
24	8 27	4 40 48.46	20 35 51.7	1.1	9.2	0.72	10	5 31	4 42 20.44	20 49 49.1	1.0	8.5	0.66
25	8 23	4 40 40.20	+20 35 50.2	1.0	9.2	0.72	11	5 28	4 42 33.07	+20 50 26.7	1.0	8.5	0.66
26	8 19	4 40 32.38	20 35 49.7	1.0	9.2	0.72	12	5 24	4 42 46.12	20 51 4.9	1.0	8.5	0.66
27	8 15	4 40 25.02	20 35 50.0	1.0	9.2	0.72	13	5 20	4 42 59.60	20 51 43.9	1.0	8.5	0.66
28	8 10	4 40 18.12	20 35 51.2	1.0	9.2	0.71	14	5 16	4 43 13.49	20 52 23.4	1.0	8.4	0.66
29	8 6	4 40 11.68	20 35 53.4	1.0	9.2	0.71	15	5 13	4 43 27.80	20 53 3.6	1.0	8.4	0.66
30	8 2	4 40 5.70	+20 35 56.6	1.0	9.2	0.71	Sept. 16	18 25	6 7 0.09	+22 17 45.7	1.0	8.5	0.67
31	7 58	4 40 0.18	20 36 0.7	1.0	9.1	0.71	17	18 21	6 7 12.82	22 17 41.2	1.0	8.5	0.67
Feb. 1	7 54	4 39 55.13	20 36 5.7	1.0	9.1	0.71	18	18 17	6 7 25.12	22 17 36.7	1.0	8.5	0.68
2	7 50	4 39 50.56	20 36 11.7	1.0	9.1	0.71	19	18 14	6 7 36.99	22 17 32.1	1.0	8.5	0.68
3	7 46	4 39 46.45	20 36 18.6	1.0	9.1	0.71	20	18 10	6 7 48.41	22 17 27.6	1.0	8.6	0.68
4	7 42	4 39 42.81	+20 36 26.4	1.0	9.1	0.71	21	18 6	6 7 59.40	+22 17 23.1	1.0	8.6	0.68
5	7 38	4 39 39.65	20 36 35.1	1.0	9.1	0.71	22	18 2	6 8 9.95	22 17 18.7	1.0	8.6	0.68
6	7 34	4 39 36.97	20 36 44.8	1.0	9.0	0.71	23	17 59	6 8 20.06	22 17 14.3	1.0	8.6	0.68
7	7 30	4 39 34.76	20 36 55.5	1.0	9.0	0.70	24	17 55	6 8 29.71	22 17 9.9	1.0	8.6	0.68
8	7 26	4 39 33.02	20 37 7.1	1.0	9.0	0.70	25	17 51	6 8 38.91	22 17 5.6	1.0	8.6	0.69
9	7 22	4 39 31.76	+20 37 19.6	1.0	9.0	0.70	26	17 47	6 8 47.65	+22 17 1.4	1.0	8.6	0.69
10	7 19	4 39 30.97	20 37 33.2	1.0	9.0	0.70	27	17 43	6 8 55.94	22 16 57.2	1.0	8.6	0.69
11	7 15	4 39 30.67	20 37 47.7	1.0	9.0	0.70	28	17 40	6 9 3.77	22 16 53.1	1.0	8.7	0.69
12	7 11	4 39 30.84	20 38 3.0	1.0	8.9	0.70	29	17 36	6 9 11.14	22 16 49.0	1.0	8.7	0.69
13	7 7	4 39 31.48	20 38 19.3	1.0	8.9	0.69	30	17 32	6 9 18.06	22 16 45.1	1.0	8.7	0.69
14	7 3	4 39 32.60	+20 38 36.4	1.0	8.9	0.69	Oct. 1	17 28	6 9 24.52	+22 16 41.2	1.0	8.7	0.69

Stellar magnitude at opposition, in December, 1913, −0.2.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	17 28	6 9 24.52	+22 16 41.2	1.0	8.7	0.69	Nov. 16	14 24	6 5 54.54	+22 16 16.9	1.1	9.4	0.74
2	17 24	6 9 30.51	22 16 37.5	1.0	8.8	0.69	17	14 20	6 5 39.74	22 16 19.7	1.1	9.4	0.74
3	17 21	6 9 36.03	22 16 33.8	1.0	8.8	0.69	18	14 16	6 5 24.58	22 16 22.6	1.1	9.5	0.74
4	17 17	6 9 41.08	22 16 30.3	1.0	8.8	0.69	19	14 11	6 5 9.06	22 16 25.5	1.1	9.5	0.74
5	17 13	6 9 45.66	22 16 26.8	1.0	8.8	0.69	20	14 7	6 4 53.20	22 16 28.5	1.1	9.5	0.75
6	17 9	6 9 49.77	+22 16 23.4	1.0	8.8	0.70	21	14 3	6 4 37.01	+22 16 31.7	1.1	9.5	0.75
7	17 5	6 9 53.41	22 16 20.2	1.0	8.8	0.70	22	13 59	6 4 20.50	22 16 34.8	1.1	9.5	0.75
8	17 1	6 9 56.57	22 16 17.1	1.0	8.8	0.70	23	13 55	6 4 3.67	22 16 38.1	1.1	9.5	0.75
9	16 57	6 9 59.26	22 16 14.2	1.0	8.8	0.70	24	13 50	6 3 46.54	22 16 41.4	1.1	9.5	0.75
10	16 53	6 10 1.47	22 16 11.4	1.0	8.9	0.70	25	13 46	6 3 29.12	22 16 44.8	1.1	9.5	0.75
11	16 50	6 10 3.19	+22 16 8.7	1.0	8.9	0.70	26	13 42	6 3 11.40	+22 16 48.2	1.1	9.5	0.75
12	16 46	6 10 4.43	22 16 6.2	1.0	8.9	0.70	27	13 38	6 2 53.41	22 16 51.7	1.1	9.5	0.75
13	16 42	6 10 5.19	22 16 3.8	1.0	8.9	0.70	28	13 34	6 2 35.15	22 16 55.1	1.1	9.5	0.75
14	16 38	6 10 5.48	22 16 1.5	1.0	8.9	0.70	29	13 29	6 2 16.63	22 16 58.6	1.1	9.6	0.75
15	16 34	6 10 5.29	22 15 59.5	1.0	8.9	0.70	30	13 25	6 1 57.87	22 17 2.2	1.1	9.6	0.76
16	16 30	6 10 4.60	+22 15 57.6	1.0	9.0	0.71	Dec. 1	13 21	6 1 38.87	+22 17 5.8	1.1	9.6	0.76
17	16 26	6 10 3.43	22 15 55.9	1.0	9.0	0.71	2	13 16	6 1 19.64	22 17 9.4	1.1	9.6	0.76
18	16 22	6 10 1.77	22 15 54.3	1.0	9.0	0.71	3	13 12	6 1 0.19	22 17 13.0	1.1	9.6	0.76
19	16 18	6 9 59.64	22 15 52.8	1.0	9.0	0.71	4	13 8	6 0 40.53	22 17 16.5	1.1	9.6	0.76
20	16 14	6 9 57.02	22 15 51.4	1.0	9.0	0.71	5	13 4	6 0 20.68	22 17 20.1	1.1	9.6	0.76
21	16 10	6 9 53.92	+22 15 50.4	1.0	9.0	0.72	6	13 0	6 0 0.65	+22 17 23.8	1.1	9.6	0.76
22	16 6	6 9 50.35	22 15 49.5	1.0	9.1	0.72	7	12 55	5 59 40.44	22 17 27.4	1.1	9.6	0.76
23	16 2	6 9 46.31	22 15 48.7	1.0	9.1	0.72	8	12 51	5 59 20.06	22 17 31.0	1.1	9.6	0.76
24	15 58	6 9 41.79	22 15 48.2	1.0	9.1	0.72	9	12 47	5 58 59.53	22 17 34.6	1.1	9.6	0.76
25	15 54	6 9 36.80	22 15 47.7	1.0	9.1	0.72	10	12 42	5 58 38.87	22 17 38.2	1.1	9.6	0.76
26	15 50	6 9 31.34	+22 15 47.5	1.0	9.1	0.72	11	12 38	5 58 18.07	+22 17 41.8	1.1	9.6	0.76
27	15 46	6 9 25.41	22 15 47.4	1.0	9.1	0.72	12	12 34	5 57 57.15	22 17 45.4	1.1	9.6	0.76
28	15 42	6 9 19.03	22 15 47.5	1.0	9.2	0.72	13	12 30	5 57 36.12	22 17 48.9	1.1	9.6	0.76
29	15 38	6 9 12.18	22 15 47.8	1.0	9.2	0.72	14	12 25	5 57 15.00	22 17 52.4	1.1	9.6	0.76
30	15 34	6 9 4.88	22 15 48.1	1.0	9.2	0.72	15	12 21	5 56 53.80	22 17 55.9	1.1	9.6	0.76
31	15 30	6 8 57.12	+22 15 48.7	1.0	9.2	0.73	16	12 17	5 56 32.53	+22 17 59.5	1.1	9.6	0.76
Nov. 1	15 26	6 8 48.91	22 15 49.5	1.1	9.2	0.73	17	12 12	5 56 11.20	22 18 3.0	1.1	9.6	0.76
2	15 22	6 8 40.25	22 15 50.4	1.1	9.2	0.73	18	12 8	5 55 49.84	22 18 6.5	1.1	9.6	0.76
3	15 18	6 8 31.15	22 15 51.4	1.1	9.3	0.73	19	12 4	5 55 28.46	22 18 9.9	1.1	9.6	0.76
4	15 14	6 8 21.61	22 15 52.6	1.1	9.3	0.73	20	12 0	5 55 7.05	22 18 13.4	1.1	9.6	0.76
5	15 9	6 8 11.64	+22 15 53.9	1.1	9.3	0.73	21	11 55	5 54 45.64	+22 18 16.8	1.1	9.6	0.76
6	15 5	6 8 1.24	22 15 55.4	1.1	9.3	0.73	22	11 51	5 54 24.24	22 18 20.2	1.1	9.6	0.76
7	15 1	6 7 50.41	22 15 57.0	1.1	9.3	0.73	23	11 47	5 54 2.86	22 18 23.6	1.1	9.6	0.76
8	14 57	6 7 39.15	22 15 58.7	1.1	9.3	0.73	24	11 42	5 53 41.52	22 18 27.0	1.1	9.6	0.76
9	14 53	6 7 27.48	22 16 0.5	1.1	9.3	0.73	25	11 38	5 53 20.23	22 18 30.3	1.1	9.6	0.76
10	14 49	6 7 15.40	+22 16 2.4	1.1	9.3	0.74	26	11 34	5 52 58.99	+22 18 33.7	1.1	9.6	0.76
11	14 45	6 7 2.91	22 16 4.5	1.1	9.4	0.74	27	11 30	5 52 37.83	22 18 37.1	1.1	9.6	0.76
12	14 41	6 6 50.01	22 16 6.8	1.1	9.4	0.74	28	11 25	5 52 16.75	22 18 40.4	1.1	9.6	0.76
13	14 36	6 6 36.71	22 16 9.2	1.1	9.4	0.74	29	11 21	5 51 55.77	22 18 43.7	1.1	9.6	0.76
14	14 32	6 6 23.04	22 16 11.7	1.1	9.4	0.74	30	11 17	5 51 34.89	22 18 47.1	1.1	9.6	0.76
15	14 28	6 6 8.98	+22 16 14.2	1.1	9.4	0.74	31	11 12	5 51 14.13	+22 18 50.4	1.1	9.6	0.76
16	14 24	6 5 54.54	+22 16 16.9	1.1	9.4	0.74	32	11 8	5 50 53.51	+22 18 53.7	1.1	9.6	0.76

Stellar magnitude at opposition, in December, 1914, —0.2.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
May 1	18 19	20 56 42.03	−17 56 34.8	0.4	1.7	0.12	June 16	15 17	20 55 32.56	−18 3 1.3	0.5	1.8	0.12
2	18 15	20 56 44.89	17 56 25.4	0.4	1.7	0.12	17	15 13	20 55 26.81	18 3 26.7	0.5	1.8	0.12
3	18 11	20 56 47.55	17 56 16.8	0.4	1.7	0.12	18	15 8	20 55 20.91	18 3 52.7	0.5	1.8	0.12
4	18 7	20 56 50.01	17 56 8.9	0.4	1.7	0.12	19	15 4	20 55 14.85	18 4 19.3	0.5	1.8	0.12
5	18 3	20 56 52.28	17 56 1.9	0.4	1.7	0.12	20	15 0	20 55 8.64	18 4 56.5	0.5	1.8	0.12
6	17 59	20 56 54.35	−17 55 55.7	0.4	1.7	0.12	21	14 56	20 55 2.29	−18 5 14.2	0.5	1.8	0.12
7	17 55	20 56 56.21	17 55 50.3	0.4	1.7	0.12	22	14 52	20 54 55.79	18 5 42.5	0.5	1.8	0.12
8	17 51	20 56 57.88	17 55 45.8	0.4	1.7	0.12	23	14 48	20 54 49.14	18 6 11.3	0.5	1.8	0.12
9	17 47	20 56 59.35	17 55 42.1	0.4	1.7	0.12	24	14 44	20 54 42.35	18 6 40.7	0.5	1.8	0.12
10	17 43	20 57 0.62	17 55 39.1	0.4	1.7	0.12	25	14 40	20 54 35.43	18 7 10.5	0.5	1.8	0.12
11	17 40	20 57 1.69	−17 55 37.0	0.4	1.7	0.12	26	14 36	20 54 28.37	−18 7 40.8	0.5	1.8	0.12
12	17 36	20 57 2.57	17 55 35.7	0.4	1.7	0.12	27	14 32	20 54 21.18	18 8 11.7	0.5	1.8	0.12
13	17 32	20 57 3.25	17 55 35.2	0.4	1.7	0.12	28	14 28	20 54 13.86	18 8 43.1	0.5	1.8	0.12
14	17 28	20 57 3.72	17 55 35.6	0.4	1.7	0.12	29	14 24	20 54 6.42	18 9 14.9	0.5	1.8	0.12
15	17 24	20 57 4.00	17 55 36.8	0.5	1.7	0.12	30	14 20	20 53 58.85	18 9 47.2	0.5	1.8	0.12
16	17 20	20 57 4.08	−17 55 38.7	0.5	1.7	0.12	July 1	14 16	20 53 51.17	−18 10 19.9	0.5	1.8	0.12
17	17 16	20 57 3.96	17 55 41.5	0.5	1.7	0.12	2	14 12	20 53 43.37	18 10 53.0	0.5	1.8	0.12
18	17 12	20 57 3.65	17 55 45.1	0.5	1.7	0.12	3	14 8	20 53 35.46	18 11 26.5	0.5	1.8	0.12
19	17 8	20 57 3.14	17 55 49.5	0.5	1.7	0.12	4	14 4	20 53 27.44	18 12 0.4	0.5	1.8	0.12
20	17 4	20 57 2.43	17 55 54.7	0.5	1.7	0.12	5	14 0	20 53 19.31	18 12 34.7	0.5	1.8	0.12
21	17 0	20 57 1.53	−17 56 0.7	0.5	1.7	0.12	6	13 56	20 53 11.08	−18 13 9.4	0.5	1.8	0.12
22	16 56	20 57 0.43	17 56 7.5	0.5	1.7	0.12	7	13 51	20 53 2.74	18 13 44.3	0.5	1.8	0.12
23	16 52	20 56 59.13	17 56 15.1	0.5	1.7	0.12	8	13 47	20 52 54.31	18 14 19.5	0.5	1.8	0.12
24	16 48	20 56 57.64	17 56 23.6	0.5	1.7	0.12	9	13 43	20 52 45.79	18 14 55.1	0.5	1.8	0.12
25	16 44	20 56 55.95	17 56 32.8	0.5	1.7	0.12	10	13 39	20 52 37.18	18 15 31.0	0.5	1.8	0.12
26	16 40	20 56 54.08	−17 56 42.8	0.5	1.7	0.12	11	13 35	20 52 28.47	−18 16 7.2	0.5	1.8	0.12
27	16 37	20 56 52.01	17 56 53.6	0.5	1.7	0.12	12	13 31	20 52 19.68	18 16 43.7	0.5	1.8	0.12
28	16 33	[illegible]0 56 49.74	17 57 5.1	0.5	1.7	0.12	13	13 27	20 52 10.81	18 17 20.4	0.5	1.8	0.12
29	16 29	20 56 47.29	17 57 17.4	0.5	1.7	0.12	14	13 23	20 52 1.86	18 17 57.4	0.5	1.8	0.12
30	16 25	20 56 44.65	17 57 30.4	0.5	1.7	0.12	15	13 19	20 51 52.84	18 18 34.6	0.5	1.8	0.12
31	16 21	20 56 41.82	−17 57 44.2	0.5	1.7	0.12	16	13 15	20 51 43.74	−18 19 12.0	0.5	1.8	0.12
June 1	16 17	20 56 38.81	17 57 58.8	0.5	1.7	0.12	17	13 11	20 51 34.58	18 19 49.7	0.5	1.8	0.12
2	16 13	20 56 35.62	17 58 14.1	0.5	1.7	0.12	18	13 7	20 51 25.36	18 20 27.6	0.5	1.8	0.12
3	16 9	20 56 32.24	17 58 30.2	0.5	1.7	0.12	19	13 2	20 51 16.08	18 21 5.6	0.5	1.8	0.12
4	16 5	20 56 28.69	17 58 47.0	0.5	1.7	0.12	20	12 58	20 51 6.74	18 21 43.8	0.5	1.8	0.12
5	16 1	20 56 24.96	−17 59 4.5	0.5	1.7	0.12	21	12 54	20 50 57.35	−18 22 22.2	0.5	1.8	0.12
6	15 57	20 56 21.05	17 59 22.6	0.5	1.7	0.12	22	12 50	20 50 47.91	18 23 0.7	0.5	1.8	0.12
7	15 53	20 56 16.96	17 59 41.4	0.5	1.7	0.12	23	12 46	20 50 38.43	18 23 39.3	0.5	1.8	0.12
8	15 49	20 56 12.70	18 0 0.9	0.5	1.7	0.12	24	12 42	20 50 28.91	18 24 17.9	0.5	1.8	0.12
9	15 45	20 56 8.27	18 0 21.2	0.5	1.7	0.12	25	12 38	20 50 19.36	18 24 56.6	0.5	1.8	0.12
10	15 41	20 56 3.66	−18 0 42.1	0.5	1.7	0.12	26	12 34	20 50 9.77	−18 25 35.3	0.5	1.8	0.12
11	15 37	20 55 58.89	18 1 3.7	0.5	1.8	0.12	27	12 30	20 50 0.15	18 26 14.1	0.5	1.8	0.12
12	15 33	20 55 53.95	18 1 25.9	0.5	1.8	0.12	28	12 26	20 49 50.51	18 26 52.9	0.5	1.8	0.12
13	15 29	20 55 48.85	18 1 48.8	0.5	1.8	0.12	29	12 22	20 49 40.86	18 27 31.7	0.5	1.8	0.12
14	15 25	20 55 43.58	18 2 12.4	0.5	1.8	0.12	30	12 17	20 49 31.19	18 28 10.5	0.5	1.8	0.12
15	15 21	20 55 38.15	−18 2 36.6	0.5	1.8	0.12	31	12 13	20 49 21.50	−18 28 49.3	0.5	1.8	0.12
16	15 17	20 55 32.56	−18 3 1.3	0.5	1.8	0.12	Aug. 1	12 9	20 49 11.81	−18 29 28.0	0.5	1.8	0.12

Stellar magnitude at opposition, in August, 1914, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Aug. 1	12 9	20 49 11.81	-18 29 28.0	0.5	1.8	0.12	Sept. 16	9 2	20 42 43.60	-18 54 12.1	0.5	1.7	0.12
2	12 5	20 49 2.11	18 30 6.7	0.5	1.8	0.12	17	8 58	20 42 37.75	18 54 33.1	0.5	1.7	0.12
3	12 1	20 48 52.41	18 30 45.3	0.5	1.8	0.12	18	8 54	20 42 32.07	18 54 53.4	0.5	1.7	0.12
4	11 57	20 48 42.72	18 31 23.7	0.5	1.8	0.12	19	8 50	20 42 26.55	18 55 13.1	0.5	1.7	0.12
5	11 53	20 48 33.03	18 32 2.1	0.5	1.8	0.12	20	8 46	20 42 21.20	18 55 32.1	0.5	1.7	0.12
6	11 49	20 48 23.36	-18 32 40.4	0.5	1.8	0.12	21	8 42	20 42 16.02	-18 55 50.4	0.5	1.7	0.12
7	11 45	20 48 13.70	18 33 18.5	0.5	1.8	0.12	22	8 38	20 42 11.01	18 56 8.0	0.5	1.7	0.12
8	11 41	20 48 4.05	18 33 56.5	0.5	1.8	0.12	23	8 34	20 42 6.17	18 56 25.0	0.5	1.7	0.12
9	11 37	20 47 54.43	18 34 34.3	0.5	1.8	0.12	24	8 30	20 42 1.51	18 56 41.3	0.5	1.7	0.12
10	11 32	20 47 44.84	18 35 12.0	0.5	1.8	0.12	25	8 26	20 41 57.03	18 56 56.8	0.5	1.7	0.12
11	11 28	20 47 35.28	-18 35 49.5	0.5	1.8	0.12	26	8 22	20 41 52.73	-18 57 11.6	0.5	1.7	0.12
12	11 24	20 47 25.75	18 36 26.7	0.5	1.8	0.12	27	8 18	20 41 48.61	18 57 25.8	0.5	1.7	0.12
13	11 20	20 47 16.26	18 37 3.7	0.5	1.8	0.12	28	8 14	20 41 44.67	18 57 39.2	0.5	1.7	0.12
14	11 16	20 47 6.82	18 37 40.5	0.5	1.8	0.12	29	8 10	20 41 40.91	18 57 51.9	0.5	1.7	0.12
15	11 12	20 46 57.42	18 38 17.1	0.5	1.8	0.12	30	8 6	20 41 37.34	18 58 3.9	0.5	1.7	0.12
16	11 8	20 46 48.07	-18 38 53.4	0.5	1.8	0.12	Oct. 1	8 2	20 41 33.96	-18 58 15.1	0.5	1.7	0.12
17	11 4	20 46 38.77	18 39 29.4	0.5	1.8	0.12	2	7 58	20 41 30.77	18 58 25.6	0.5	1.7	0.12
18	11 0	20 46 29.54	18 40 5.1	0.5	1.8	0.12	3	7 54	20 41 27.76	18 58 35.3	0.5	1.7	0.12
19	10 56	20 46 20.37	18 40 40.5	0.5	1.8	0.12	4	7 50	20 41 24.95	18 58 44.3	0.5	1.7	0.12
20	10 52	20 46 11.26	18 41 15.6	0.5	1.8	0.12	5	7 46	20 41 22.33	18 58 52.5	0.5	1.7	0.12
21	10 48	20 46 2.22	-18 41 50.3	0.5	1.8	0.12	6	7 42	20 41 19.91	-18 59 0.0	0.5	1.7	0.12
22	10 43	20 45 53.26	18 42 24.7	0.5	1.8	0.12	7	7 38	20 41 17.68	18 59 6.8	0.5	1.7	0.12
23	10 39	20 45 44.38	18 42 58.7	0.5	1.8	0.12	8	7 34	20 41 15.65	18 59 12.8	0.5	1.7	0.12
24	10 35	20 45 35.57	18 43 32.3	0.5	1.8	0.12	9	7 30	20 41 13.81	18 59 18.0	0.5	1.7	0.12
25	10 31	20 45 26.85	18 44 5.5	0.5	1.8	0.12	10	7 26	20 41 12.18	18 59 22.5	0.5	1.7	0.12
26	10 27	20 45 18.22	-18 44 38.3	0.5	1.8	0.12	11	7 22	20 41 10.75	-18 59 26.2	0.5	1.7	0.12
27	10 23	20 45 9.68	18 45 10.7	0.5	1.8	0.12	12	7 18	20 41 9.52	18 59 29.1	0.5	1.7	0.12
28	10 19	20 45 1.25	18 45 42.6	0.5	1.8	0.12	13	7 14	20 41 8.48	18 59 31.2	0.5	1.7	0.12
29	10 15	20 44 52.92	18 46 14.1	0.5	1.8	0.12	14	7 10	20 41 7.65	18 59 32.6	0.5	1.7	0.12
30	10 11	20 44 44.68	18 46 45.1	0.5	1.8	0.12	15	7 6	20 41 7.03	18 59 33.2	0.5	1.7	0.12
31	10 7	20 44 36.55	-18 47 15.7	0.5	1.8	0.12	16	7 2	20 41 6.61	-18 59 33.0	0.5	1.7	0.12
Sept. 1	10 3	20 44 28.53	18 47 45.8	0.5	1.8	0.12	17	6 58	20 41 6.40	18 59 32.0	0.5	1.7	0.12
2	9 59	20 44 20.63	18 48 15.4	0.5	1.8	0.12	18	6 55	20 41 6.40	18 59 30.2	0.5	1.7	0.12
3	9 55	20 44 12.84	18 48 44.4	0.5	1.8	0.12	19	6 51	20 41 6.60	18 59 27.7	0.4	1.7	0.12
4	9 51	20 44 5.17	18 49 13.0	0.5	1.8	0.12	20	6 47	20 41 7.01	18 59 24.4	0.4	1.7	0.12
5	9 46	20 43 57.63	-18 49 41.0	0.5	1.8	0.12	21	6 43	20 41 7.64	-18 59 20.2	0.4	1.7	0.12
6	9 42	20 43 50.21	18 50 8.5	0.5	1.8	0.12	22	6 39	20 41 8.47	18 59 15.2	0.4	1.7	0.12
7	9 38	20 43 42.92	18 50 35.5	0.5	1.8	0.12	23	6 35	20 41 9.51	18 59 9.5	0.4	1.7	0.12
8	9 34	20 43 35.77	18 51 1.9	0.5	1.8	0.12	24	6 31	20 41 10.76	18 59 3.0	0.4	1.7	0.12
9	9 30	20 43 28.75	18 51 27.8	0.5	1.8	0.12	25	6 27	20 41 12.22	18 58 55.7	0.4	1.7	0.12
10	9 26	20 43 21.86	-18 51 53.1	0.5	1.8	0.12	26	6 23	20 41 13.88	-18 58 47.6	0.4	1.7	0.12
11	9 22	20 43 15.12	18 52 17.8	0.5	1.8	0.12	27	6 19	20 41 15.75	18 58 38.8	0.4	1.7	0.12
12	9 18	20 43 8.52	18 52 41.9	0.5	1.8	0.12	28	6 15	20 41 17.83	18 58 29.2	0.4	1.7	0.12
13	9 14	20 43 2.06	18 53 5.4	0.5	1.8	0.12	29	6 12	20 41 20.12	18 58 18.8	0.4	1.7	0.12
14	9 10	20 42 55.75	18 53 28.3	0.5	1.8	0.12	30	6 8	20 41 22.61	18 58 7.5	0.4	1.7	0.12
15	9 6	20 42 49.60	-18 53 50.5	0.5	1.7	0.12	31	6 4	20 41 25.31	-18 57 55.4	0.4	1.7	0.12
16	9 2	20 42 43.60	-18 54 12.1	0.5	1.7	0.12	Nov. 1	6 0	20 41 28.22	-18 57 42.5	0.4	1.7	0.12

Stellar magnitude at opposition, in August, 1914, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Jan. 0	13 17	7 57 5.79	+20 16 19.8	0.3	1.3	0.09
1	13 13	7 56 59.09	20 16 38.9	0.3	1.3	0.09
2	13 9	7 56 52.35	20 16 58.0	0.3	1.3	0.09
3	13 5	7 56 45.57	20 17 17.3	0.3	1.3	0.09
4	13 1	7 56 38.75	20 17 36.8	0.3	1.3	0.09
5	12 57	7 56 31.89	+20 17 56.4	0.3	1.3	0.09
6	12 53	7 56 25.00	20 18 16.0	0.3	1.3	0.09
7	12 49	7 56 18.08	20 18 35.7	0.3	1.3	0.09
8	12 44	7 56 11.13	20 18 55.5	0.3	1.3	0.09
9	12 40	7 56 4.16	20 19 15.3	0.3	1.3	0.09
10	12 36	7 55 57.16	+20 19 35.2	0.3	1.3	0.09
11	12 32	7 55 50.15	20 19 55.2	0.3	1.3	0.09
12	12 28	7 55 43.12	20 20 15.2	0.3	1.3	0.09
13	12 24	7 55 36.08	20 20 35.2	0.3	1.3	0.09
14	12 20	7 55 29.02	20 20 55.3	0.3	1.3	0.09
15	12 16	7 55 21.95	+20 21 15.4	0.3	1.3	0.09
16	12 12	7 55 14.88	20 21 35.5	0.3	1.3	0.09
17	12 8	7 55 7.81	20 21 55.6	0.3	1.3	0.09
18	12 4	7 55 0.73	20 22 15.8	0.3	1.3	0.09
19	12 0	7 54 53.66	20 22 35.9	0.3	1.3	0.09
20	11 56	7 54 46.59	+20 22 56.0	0.3	1.3	0.09
21	11 52	7 54 39.53	20 23 16.1	0.3	1.3	0.09
22	11 48	7 54 32.48	20 23 36.1	0.3	1.3	0.09
23	11 44	7 54 25.45	20 23 56.1	0.3	1.3	0.09
24	11 40	7 54 18.43	20 24 16.0	0.3	1.3	0.09
25	11 36	7 54 11.43	+20 24 35.9	0.3	1.3	0.09
26	11 32	7 54 4.46	20 24 55.7	0.3	1.3	0.09
27	11 28	7 53 57.51	20 25 15.5	0.3	1.3	0.09
28	11 23	7 53 50.60	20 25 35.2	0.3	1.3	0.09
29	11 19	7 53 43.72	20 25 54.8	0.3	1.3	0.09
30	11 15	7 53 36.87	+20 26 14.3	0.3	1.3	0.09
31	11 11	7 53 30.06	20 26 33.7	0.3	1.3	0.09
Feb. 1	11 7	7 53 23.29	20 26 52.9	0.3	1.3	0.09
2	11 3	7 53 16.57	20 27 12.1	0.3	1.3	0.09
3	10 59	7 53 9.89	20 27 31.1	0.3	1.3	0.09
4	10 55	7 53 3.26	+20 27 50.0	0.3	1.3	0.09
5	10 51	7 52 56.68	20 28 8.7	0.3	1.3	0.09
6	10 47	7 52 50.16	20 28 27.3	0.3	1.3	0.09
7	10 43	7 52 43.69	20 28 45.7	0.3	1.3	0.09
8	10 39	7 52 37.28	20 29 4.0	0.3	1.3	0.09
9	10 35	7 52 30.94	+20 29 22.1	0.3	1.3	0.09
10	10 31	7 52 24.66	20 29 40.0	0.3	1.3	0.09
11	10 27	7 52 18.44	20 29 57.8	0.3	1.3	0.09
12	10 23	7 52 12.29	20 30 15.4	0.3	1.3	0.09
13	10 19	7 52 6.21	20 30 32.8	0.3	1.3	0.09
14	10 15	7 52 0.21	+20 30 50.0	0.3	1.3	0.09
15	10 11	7 51 54.28	+20 31 7.0	0.3	1.3	0.09
Feb. 15	10 11	7 51 54.28	+20 31 7.0	0.3	1.3	0.09
16	10 7	7 51 48.43	20 31 23.8	0.3	1.3	0.09
17	10 3	7 51 42.66	20 31 40.3	0.3	1.3	0.09
18	9 59	7 51 36.97	20 31 56.7	0.3	1.3	0.09
19	9 55	7 51 31.37	20 32 12.8	0.3	1.3	0.09
20	9 51	7 51 25.85	+20 32 28.7	0.3	1.3	0.09
21	9 47	7 51 20.43	20 32 44.3	0.3	1.3	0.09
22	9 43	7 51 15.10	20 32 59.7	0.3	1.3	0.09
23	9 39	7 51 9.86	20 33 14.9	0.3	1.3	0.09
24	9 35	7 51 4.72	20 33 29.8	0.3	1.3	0.09
25	9 31	7 50 59.68	+20 33 44.5	0.3	1.3	0.09
26	9 27	7 50 54.74	20 33 58.9	0.3	1.3	0.09
27	9 23	7 50 49.90	20 34 13.1	0.3	1.3	0.09
28	9 19	7 50 45.16	20 34 26.9	0.3	1.3	0.09
Mar. 1	9 15	7 50 40.53	20 34 40.5	0.3	1.3	0.09
2	9 11	7 50 36.01	+20 34 53.7	0.3	1.3	0.09
3	9 7	7 50 31.60	20 35 6.7	0.3	1.3	0.09
4	9 2	7 50 27.30	20 35 19.4	0.3	1.3	0.09
5	8 58	7 50 23.11	20 35 31.8	0.3	1.3	0.09
6	8 54	7 50 19.04	20 35 43.9	0.3	1.3	0.09
7	8 50	7 50 15.09	+20 35 55.7	0.3	1.3	0.09
8	8 46	7 50 11.25	20 36 7.2	0.3	1.3	0.09
9	8 43	7 50 7.53	20 36 18.3	0.3	1.3	0.09
10	8 39	7 50 3.93	20 36 29.2	0.3	1.3	0.09
11	8 35	7 50 0.45	20 36 39.7	0.3	1.3	0.09
12	8 31	7 49 57.09	+20 36 50.0	0.3	1.3	0.09
13	8 27	7 49 53.86	20 36 59.9	0.3	1.3	0.09
14	8 23	7 49 50.75	20 37 9.5	0.3	1.3	0.09
15	8 19	7 49 47.77	20 37 18.7	0.3	1.3	0.09
16	8 15	7 49 44.91	20 37 27.6	0.3	1.3	0.09
17	8 11	7 49 42.18	+20 37 36.2	0.3	1.3	0.09
18	8 7	7 49 39.58	20 37 44.5	0.3	1.3	0.09
19	8 3	7 49 37.11	20 37 52.4	0.3	1.3	0.09
20	7 59	7 49 34.77	20 38 0.0	0.3	1.3	0.09
21	7 55	7 49 32.57	20 38 7.2	0.3	1.3	0.09
22	7 51	7 49 30.50	+20 38 14.1	0.3	1.3	0.09
23	7 47	7 49 28.56	20 38 20.6	0.3	1.3	0.09
24	7 43	7 49 26.76	20 38 26.8	0.3	1.3	0.09
25	7 39	7 49 25.09	20 38 32.7	0.3	1.3	0.09
26	7 35	7 49 23.56	20 38 38.2	0.3	1.3	0.09
27	7 31	7 49 22.17	+20 38 43.4	0.3	1.3	0.09
28	7 27	7 49 20.92	20 38 48.2	0.3	1.3	0.09
29	7 23	7 49 19.80	20 38 52.6	0.3	1.3	0.09
30	7 19	7 49 18.83	20 38 56.6	0.3	1.3	0.09
31	7 15	7 49 17.99	20 39 0.3	0.3	1.3	0.09
Apr. 1	7 11	7 49 17.30	+20 39 3.6	0.3	1.3	0.09
2	7 7	7 49 16.74	+20 39 6.6	0.3	1.3	0.09

Stellar magnitude at opposition, in January, 1914, 7.7.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	7 11	7 49 17.30	+20 39 3.6	0.3	1.3	0.09	Nov. 16	16 28	8 10 4.18	+19 42 14.8	0.3	1.3	0.09
2	7 7	7 49 16.74	20 39 6.6	0.3	1.3	0.09	17	16 24	8 10 2.18	19 42 20.9	0.3	1.3	0.09
3	7 3	7 49 16.33	20 39 9.2	0.3	1.3	0.09	18	16 20	8 10 0.05	19 42 27.4	0.3	1.3	0.09
4	6 59	7 49 16.05	20 39 11.4	0.3	1.3	0.09	19	16 16	8 9 57.78	19 42 34.3	0.3	1.3	0.09
5	6 55	7 49 15.92	20 39 13.3	0.3	1.3	0.09	20	16 12	8 9 55.38	19 42 41.7	0.3	1.3	0.09
6	6 52	7 49 15.92	+20 39 14.8	0.3	1.3	0.09	21	16 8	8 9 52.85	+19 42 49.4	0.3	1.3	0.09
7	6 48	7 49 16.07	20 39 15.9	0.3	1.3	0.09	22	16 4	8 9 50.19	19 42 57.6	0.3	1.3	0.09
8	6 44	7 49 16.35	20 39 16.7	0.3	1.3	0.09	23	16 0	8 9 47.40	19 43 6.2	0.3	1.3	0.09
9	6 40	7 49 16.78	20 39 17.1	0.3	1.3	0.09	24	15 56	8 9 44.48	19 43 15.2	0.3	1.3	0.09
10	6 36	7 49 17.34	20 39 17.1	0.3	1.3	0.09	25	15 52	8 9 41.43	19 43 24.6	0.3	1.3	0.09
11	6 32	7 49 18.04	+20 39 16.8	0.3	1.3	0.09	26	15 48	8 9 38.26	+19 43 34.3	0.3	1.3	0.09
12	6 28	7 49 18.88	20 39 16.1	0.3	1.3	0.09	27	15 44	8 9 34.97	19 43 44.5	0.3	1.3	0.09
13	6 24	7 49 19.86	20 39 15.0	0.3	1.3	0.09	28	15 40	8 9 31.55	19 43 55.0	0.3	1.3	0.09
14	6 20	7 49 20.98	20 39 13.6	0.3	1.3	0.09	29	15 36	8 9 28.01	19 44 5.9	0.3	1.3	0.09
15	6 16	7 49 22.24	20 39 11.8	0.3	1.3	0.09	30	15 32	8 9 24.35	19 44 17.2	0.3	1.3	0.09
Oct. 16	18 29	8 9 57.12	+19 42 40.7	0.3	1.3	0.09	Dec. 1	15 28	8 9 20.57	+19 44 28.9	0.3	1.3	0.09
17	18 25	8 9 59.45	19 42 33.4	0.3	1.3	0.09	2	15 24	8 9 16.68	19 44 40.9	0.3	1.3	0.09
18	18 22	8 10 1.63	19 42 26.5	0.3	1.3	0.09	3	15 20	8 9 12.67	19 44 53.3	0.3	1.3	0.09
19	18 18	8 10 3.68	19 42 20.0	0.3	1.3	0.09	4	15 16	8 9 8.54	19 45 6.0	0.3	1.3	0.09
20	18 14	8 10 5.59	19 42 13.9	0.3	1.3	0.09	5	15 12	8 9 4.30	19 45 19.1	0.3	1.3	0.09
21	18 10	8 10 7.36	+19 42 8.3	0.3	1.3	0.09	6	15 8	8 8 59.95	+19 45 32.5	0.3	1.3	0.09
22	18 6	8 10 8.99	19 42 3.1	0.3	1.3	0.09	7	15 4	8 8 55.49	19 45 46.2	0.3	1.3	0.09
23	18 2	8 10 10.48	19 41 58.4	0.3	1.3	0.09	8	15 0	8 8 50.92	19 46 0.3	0.3	1.3	0.09
24	17 58	8 10 11.83	19 41 54.1	0.3	1.3	0.09	9	14 56	8 8 46.25	19 46 14.7	0.3	1.3	0.09
25	17 54	8 10 13.04	19 41 50.2	0.3	1.3	0.09	10	14 52	8 8 41.47	19 46 29.5	0.3	1.3	0.09
26	17 50	8 10 14.11	+19 41 46.7	0.3	1.3	0.09	11	14 48	8 8 36.59	+19 46 44.6	0.3	1.3	0.09
27	17 46	8 10 15.04	19 41 43.7	0.3	1.3	0.09	12	14 44	8 8 31.60	19 47 0.0	0.3	1.3	0.09
28	17 43	8 10 15.83	19 41 41.1	0.3	1.3	0.09	13	14 40	8 8 26.51	19 47 15.7	0.3	1.3	0.09
29	17 39	8 10 16.48	19 41 39.0	0.3	1.3	0.09	14	14 36	8 8 21.33	19 47 31.7	0.3	1.3	0.09
30	17 35	8 10 16.99	19 41 37.3	0.3	1.3	0.09	15	14 32	8 8 16.05	19 47 48.0	0.3	1.3	0.09
31	17 31	8 10 17.35	+19 41 36.0	0.3	1.3	0.09	16	14 28	8 8 10.68	+19 48 4.5	0.3	1.3	0.09
Nov. 1	17 27	8 10 17.58	19 41 35.1	0.3	1.3	0.09	17	14 24	8 8 5.22	19 48 21.4	0.3	1.3	0.09
2	17 23	8 10 17.66	19 41 34.7	0.3	1.3	0.09	18	14 20	8 7 59.67	19 48 38.5	0.3	1.3	0.09
3	17 19	8 10 17.60	19 41 34.7	0.3	1.3	0.09	19	14 16	8 7 54.03	19 48 55.9	0.3	1.3	0.09
4	17 15	8 10 17.40	19 41 35.2	0.3	1.3	0.09	20	14 12	8 7 48.31	19 49 13.5	0.3	1.3	0.09
5	17 11	8 10 17.06	+19 41 36.1	0.3	1.3	0.09	21	14 8	8 7 42.51	+19 49 31.4	0.3	1.3	0.09
6	17 7	8 10 16.59	19 41 37.5	0.3	1.3	0.09	22	14 4	8 7 36.63	19 49 49.6	0.3	1.3	0.09
7	17 3	8 10 15.97	19 41 39.3	0.3	1.3	0.09	23	14 0	8 7 30.68	19 50 8.0	0.3	1.3	0.09
8	16 59	8 10 15.22	19 41 41.5	0.3	1.3	0.09	24	13 56	8 7 24.65	19 50 26.6	0.3	1.3	0.09
9	16 55	8 10 14.32	19 41 44.1	0.3	1.3	0.09	25	13 52	8 7 18.55	19 50 45.4	0.3	1.3	0.09
10	16 51	8 10 13.29	+19 41 47.2	0.3	1.3	0.09	26	13 48	8 7 12.38	+19 51 4.4	0.3	1.3	0.09
11	16 47	8 10 12.12	19 41 50.7	0.3	1.3	0.09	27	13 44	8 7 6.14	19 51 23.7	0.3	1.3	0.09
12	16 44	8 10 10.81	19 41 54.7	0.3	1.3	0.09	28	13 39	8 6 59.84	19 51 43.1	0.3	1.3	0.09
13	16 40	8 10 9.36	19 41 59.1	0.3	1.3	0.09	29	13 35	8 6 53.48	19 52 2.7	0.3	1.3	0.09
14	16 36	8 10 7.77	19 42 3.9	0.3	1.3	0.09	30	13 31	8 6 47.06	19 52 22.4	0.3	1.3	0.09
15	16 32	8 10 6.04	+19 42 9.1	0.3	1.3	0.09	31	13 27	8 6 40.58	+19 52 42.3	0.3	1.3	0.09
16	16 28	8 10 4.18	+19 42 14.8	0.3	1.3	0.09	32	13 23	8 6 34.05	+19 53 2.3	0.3	1.3	0.09

Stellar magnitude at opposition, in January, 1915, 7.7.

PART III.

PHENOMENA.

In the year 1914 there will be four eclipses, two of the Sun and two of the Moon.

I.—*An Annular Eclipse of the Sun*, 1914, February 24, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

		d	h	m	s
Greenwich mean time of ☌ in right ascension,	February	24	11	15	53.9

	h	m	s			s	s	
Sun and Moon's R. A.	22	29	20.02		Hourly motions	9.49 and	110.05	
	°	′	″			′	″	
Sun's declination	9	29	28.8	S.	Hourly motion	0	55.4	N.
Moon's declination	10	27	8.2	S.	Hourly motion	13	38.5	N.
Sun's equa. hor. parallax			8.9		Sun's true semidiameter	16	9.3	
Moon's equa. hor. parallax		54	35.3		Moon's true semidiameter	14	51.8	

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.			Longitude from Greenwich.			Latitude.		
		d	h	m	°	′		°	′	
Eclipse begins	Feb.	24	9	45.6	108	1.1	E.	62	41.7	S.
Central eclipse begins		24	11	34.5	30	54.6	W.	77	35.0	S.
Central eclipse at noon		..	..	...	...	...		..	...	
Central eclipse ends		24	12	51.8	90	41.5	W.	42	51.2	S.
Eclipse ends		24	14	40.5	125	10.0	W.	9	33.5	S.

II.—*A Partial Eclipse of the Moon*, 1914, March 11, visible at Washington; the beginning visible generally in Europe, Africa, and North and South America; the ending visible generally in western Europe, western Africa, North and South America, and throughout the central and eastern portions of the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

		d	h	m	s
Greenwich mean time of ☍ in right ascension,	March	11	16	42	51.9

	h	m	s				s	
Sun's right ascension	23	26	6.49		Hourly motion		9.19	
Moon's right ascension	11	26	6.49		Hourly motion		133.65	
	°	′	″			′	″	
Sun's declination	3	39	27.0	S.	Hourly motion	0	58.9	N.
Moon's declination	3	2	44.3	N.	Hourly motion	18	4.5	S.
Sun's equa. hor. parallax			8.9		Sun's true semidiameter	16	5.6	
Moon's equa. hor. parallax		61	11.4		Moon's true semidiameter	16	39.6	

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m	
Moon enters penumbra	March	11	13	40.7	Greenwich Mean Time.
Moon enters shadow		11	14	41.8	
Middle of the eclipse		11	16	12.9	
Moon leaves shadow		11	17	44.0	
Moon leaves penumbra		11	18	45.1	

Contacts of Shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich,			and in latitude.		
	°	°	′		°	′	
First	88 to E.	38	58	W.	3	39	N.
Last	30 to W.	82	56	W.	2	44	N.

Magnitude of the eclipse = 0.916 (Moon's diameter = 1.0).

III.—*A Total Eclipse of the Sun*, 1914, August 20–21, Washington being just within the eclipse limits.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, August 20ᵈ 23ʰ 54ᵐ 55ˢ.2

	h m s		s s
Sun and Moon's R. A.	9 59 2.34	Hourly motions	9.26 and 132.48
	° ′ ″		′ ″
Sun's declination	12 19 29.6 N.	Hourly motion	0 49.7 S.
Moon's declination	13 9 44.3 N.	Hourly motion	15 15.9 S.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 48.7
Moon's equa. hor. parallax	59 17.9	Moon's true semidiameter	16 8.7

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
		d h m	° ′	° ′
Eclipse begins	Aug.	20 22 12.0	79 36.3 W.	53 49.6 N.
Central eclipse begins		20 23 26.1	121 11.9 W.	71 23.4 N.
Central eclipse at noon		20 23 54.9	2 4.2 E.	70 52.5 N.
Central eclipse ends		21 1 42.8	70 35.8 E.	23 44.7 N.
Eclipse ends		21 2 56.7	47 28.3 E.	3 57.2 N.

IV.—*A Partial Eclipse of the Moon*, 1914, September 3–4, invisible at Washington; the beginning visible generally in western North America, the Pacific Ocean, eastern Asia, Australia, and Oceanica; the ending visible generally in the central and western portions of the Pacific Ocean, Asia, Australia, the Indian Ocean, and the extreme east of Africa.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, September 4ᵈ 2ʰ 27ᵐ 25ˢ.0

	h m s		s
Sun's right ascension	10 50 36.77	Hourly motion	9.04
Moon's right ascension	22 50 36.77	Hourly motion	110.64
	° ′ ″		′ ″
Sun's declination	7 22 13.0 N.	Hourly motion	0 55.2 S.
Moon's declination	6 49 4.8 S.	Hourly motion	14 20.9 N.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 51.8
Moon's equa. hor. parallax	55 12.9	Moon's true semidiameter	15 2.0

CIRCUMSTANCES OF THE ECLIPSE.

		d h m	
Moon enters penumbra	Sept.	3 23 1.3	Greenwich Mean Time.
Moon enters shadow		4 0 16.3	
Middle of the eclipse		4 1 54.7	
Moon leaves shadow		4 3 33.1	
Moon leaves penumbra		4 4 48.1	

Contacts of Shadow with Moon's limb.	Angles of position from the north point.	The Moon being in the zenith in longitude from Greenwich.	and in latitude.
	°	° ′	° ′
First	94 to E.	174 47 E.	7 20 S.
Last	150 to W.	126 58 E.	6 33 S.

Magnitude of the eclipse = 0.864 (Moon's diameter = 1.0).

The regions within which the eclipses of the Sun are visible are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich mean time of beginning and ending at any place may be found with an uncertainty which will vary from three or four minutes for a high Sun to fifteen or twenty minutes when the Sun is near the horizon.

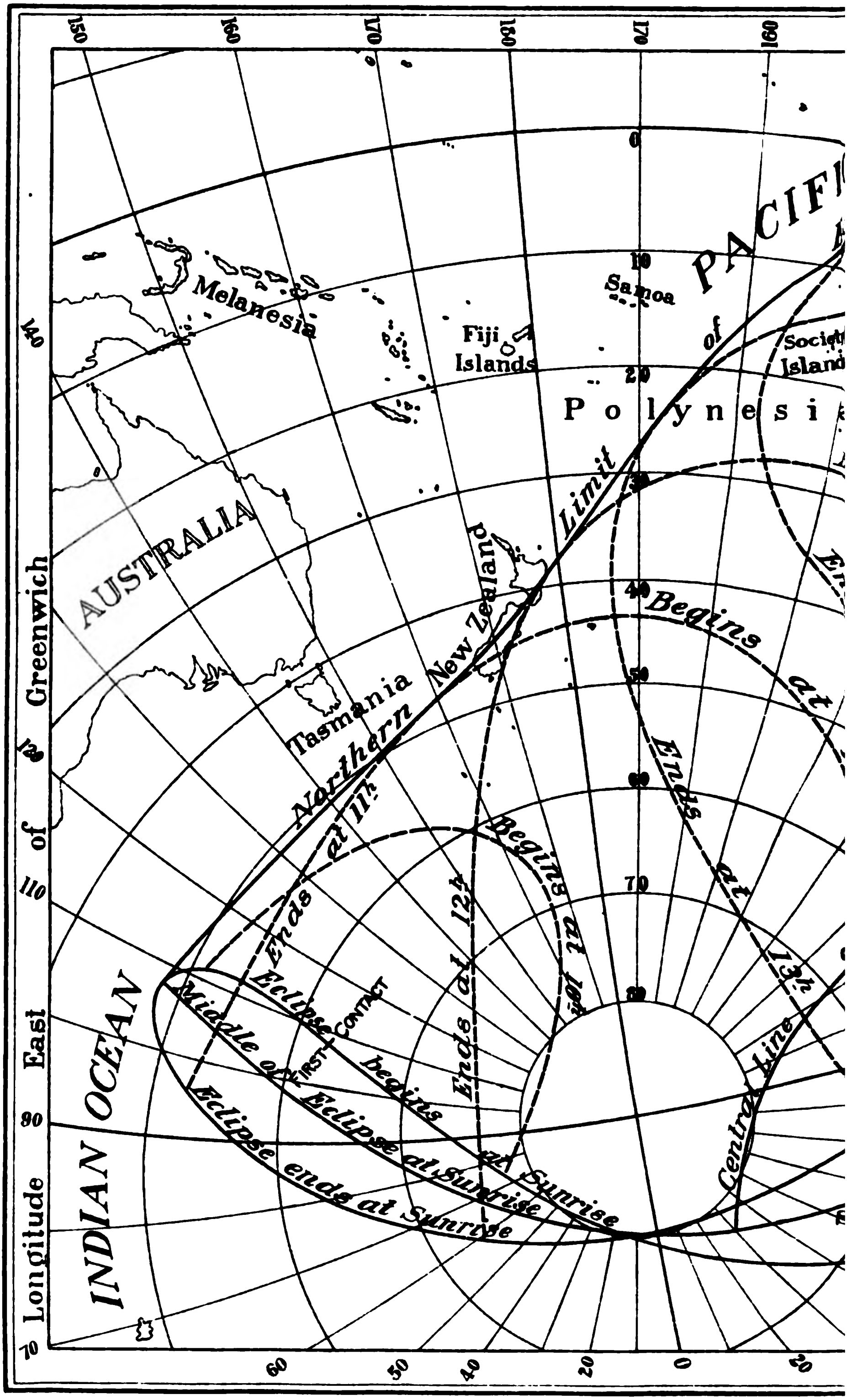
BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1914, FEBRUARY 24.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l_1	l_2
h m					° ′		
9 40	−0.72592	−1.43176	−9.21817	+9.99399	141 38.6	+0.56957	+0.02354
50	0.65022	1.39292	9.21806	9.99399	144 8.6	0.56959	0.02356
10 0	−0.57452	−1.35407	−9.21795	+9.99399	146 38.6	+0.56961	+0.02357
10	0.49882	1.31522	9.21783	9.99400	149 8.6	0.56963	0.02359
20	0.42312	1.27636	9.21772	9.99400	151 38.7	0.56965	0.02361
30	0.34742	1.23750	9.21761	9.99400	154 8.7	0.56966	0.02363
40	0.27172	1.19863	9.21750	9.99401	156 38.7	0.56968	0.02364
50	0.19602	1.15976	9.21739	9.99401	159 8.7	0.56970	0.02366
11 0	−0.12033	−1.12088	−9.21728	+9.99401	161 38.8	+0.56971	+0.02367
10	−0.04464	1.08200	9.21716	9.99402	164 8.8	0.56972	0.02369
20	+0.03105	1.04311	9.21705	9.99402	166 38.8	0.56974	0.02370
30	0.10674	1.00421	9.21694	9.99402	169 8.9	0.56975	0.02372
40	0.18243	0.96532	9.21683	9.99402	171 38.9	0.56977	0.02373
50	0.25811	0.92641	9.21672	9.99403	174 8.9	0.56978	0.02374
12 0	+0.33379	−0.88750	−9.21660	+9.99403	176 38.9	+0.56979	+0.02375
10	0.40947	0.84859	9.21649	9.99403	179 9.0	0.56980	0.02377
20	0.48514	0.80968	9.21638	9.99404	181 39.0	0.56981	0.02378
30	0.56082	0.77075	9.21627	9.99404	184 9.0	0.56982	0.02379
40	0.63648	0.73183	9.21615	9.99404	186 39.0	0.56983	0.02380
50	0.71215	0.69290	9.21604	9.99405	189 9.1	0.56984	0.02381
13 0	+0.78781	−0.65396	−9.21593	+9.99405	191 39.1	+0.56985	+0.02381
10	0.86347	0.61502	9.21582	9.99405	194 9.1	0.56986	0.02382
20	0.93913	0.57608	9.21571	9.99406	196 39.2	0.56987	0.02383
30	1.01478	0.53713	9.21559	9.99406	199 9.2	0.56987	0.02384
40	1.09043	0.49818	9.21548	9.99406	201 39.2	0.56988	0.02384
50	1.16607	0.45922	9.21537	9.99407	204 9.2	0.56989	0.02385
14 0	+1.24171	−0.42027	−9.21526	+9.99407	206 39.3	+0.56989	+0.02385
10	1.31734	0.38130	9.21514	9.99407	209 9.3	0.56990	0.02386
20	1.39298	0.34234	9.21503	9.99407	211 39.3	0.56990	0.02386
30	1.46860	0.30336	9.21492	9.99408	214 9.3	0.56990	0.02387
40	1.54422	0.26439	9.21480	9.99408	216 39.4	0.56991	0.02387
50	+1.61984	−0.22541	−9.21469	+9.99408	219 9.4	+0.56991	+0.02387

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Shadow.
h m					
9 0	+7.8791	+7.5890	+1.1762	+7.67431	+7.67214
10 0	7.8791	7.5894	1.1762	7.67430	7.67214
11 0	7.8791	7.5897	1.1762	7.67430	7.67213
12 0	7.8790	7.5901	1.1762	7.67430	7.67213
13 0	7.8789	7.5904	1.1762	7.67429	7.67212
14 0	7.8787	7.5906	1.1762	7.67429	7.67212
15 0	+7.8786	+7.5909	+1.1762	+7.67428	+7.67212

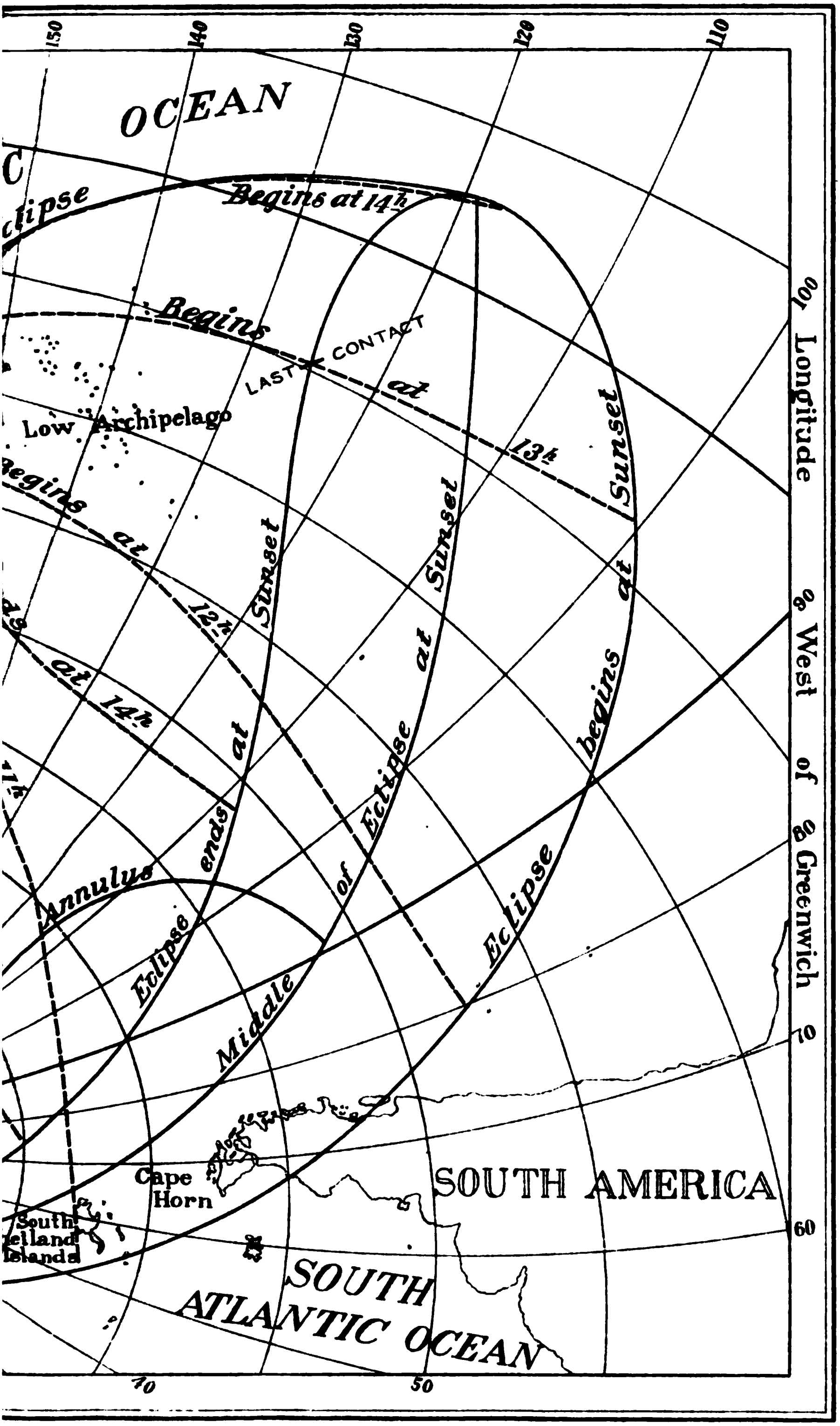
Note.—Geographical positions, central line, etc., are not given for this eclipse.

ANNULAR ECLIPSE OF



Note: *The hours of beginning and ending are*

FEBRUARY 24TH. 1914.



xpressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, 1914, AUGUST 20–21.

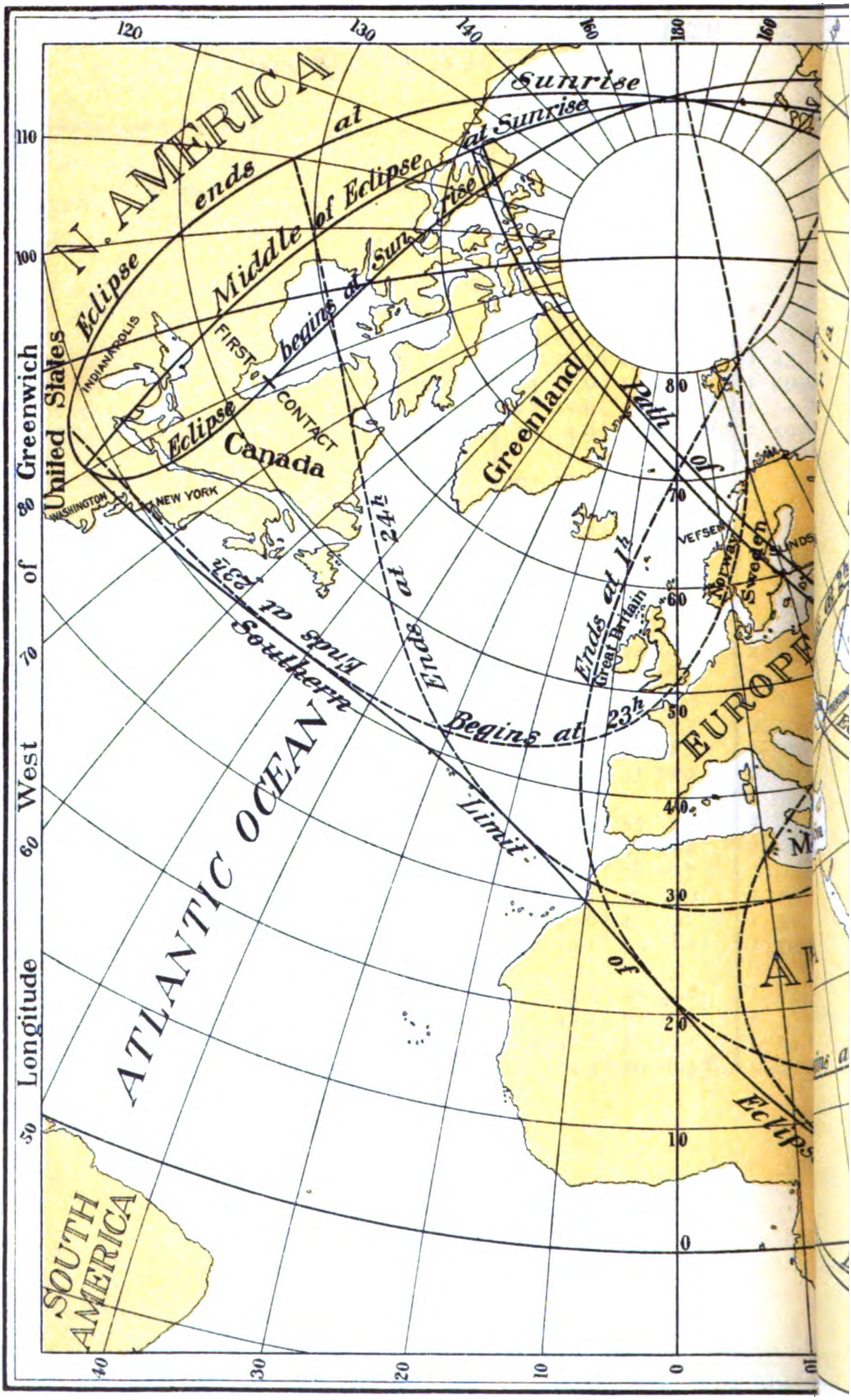
Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l_1	l_2
h m					° ′		
22 10	−0.88677	+1.27641	+9.33004	+9.98984	331 41.6	+0.54036	−0.00553
20	0.80226	1.23575	9.32996	9.98984	334 11.7	0.54035	0.00554
30	0.71774	1.19508	9.32988	9.98985	336 41.7	0.54034	0.00554
40	0.63322	1.15441	9.32981	9.98985	339 11.7	0.54033	0.00555
50	0.54870	1.11373	9.32973	9.98985	341 41.8	0.54032	0.00556
23 0	−0.46418	+1.07304	+9.32965	+9.98986	344 11.8	+0.54031	−0.00558
10	0.37966	1.03234	9.32958	9.98986	346 41.9	0.54030	0.00559
20	0.29514	0.99164	9.32950	9.98986	349 11.9	0.54029	0.00560
30	0.21062	0.95093	9.32942	9.98987	351 41.9	0.54028	0.00561
40	0.12610	0.91021	9.32935	9.98987	354 12.0	0.54026	0.00562
50	−0.04158	0.86948	9.32927	9.98988	356 42.0	0.54025	0.00564
0 0	+0.04293	+0.82875	+9.32920	+9.98988	359 12.0	+0.54024	−0.00565
10	0.12745	0.78801	9.32912	9.98988	1 42.1	0.54022	0.00567
20	0.21196	0.74727	9.32904	9.98989	4 12.1	0.54020	0.00568
30	0.29648	0.70652	9.32897	9.98989	6 42.2	0.54019	0.00570
40	0.38099	0.66576	9.32889	9.98989	9 12.2	0.54017	0.00572
50	0.46549	0.62499	9.32881	9.98990	11 42.2	0.54015	0.00574
1 0	+0.55000	+0.58422	+9.32874	+9.98990	14 12.3	+0.54013	−0.00575
10	0.63450	0.54345	9.32866	9.98990	16 42.3	0.54011	0.00577
20	0.71900	0.50266	9.32858	9.98991	19 12.3	0.54009	0.00579
30	0.80350	0.46188	9.32851	9.98991	21 42.4	0.54007	0.00581
40	0.88800	0.42108	9.32843	9.98992	24 12.4	0.54005	0.00583
50	0.97249	0.38028	9.32835	9.98992	26 42.5	0.54003	0.00586
2 0	+1.05697	+0.33948	+9.32828	+9.98992	29 12.5	+0.54001	−0.00588
10	1.14146	0.29867	9.32820	9.98993	31 42.5	0.53998	0.00590
20	1.22594	0.25785	9.32812	9.98993	34 12.6	0.53996	0.00593
30	1.31041	0.21703	9.32805	9.98993	36 42.6	0.53994	0.00595
40	1.39488	0.17621	9.32797	9.98994	39 12.6	0.53991	0.00598
50	1.47935	0.13538	9.32789	9.98994	41 42.7	0.53988	0.00600
3 0	+1.56381	+0.09454	+9.32782	+9.98994	44 12.7	+0.53986	−0.00603

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Shadow.
h m					
22 0	+7.9269	−7.6090	+1.1762	+7.66486	+7.66269
23 0	7.9270	7.6095	1.1762	7.66487	7.66270
0 0	7.9269	7.6100	1.1762	7.66487	7.66270
1 0	7.9269	7.6104	1.1762	7.66487	7.66270
2 0	7.9268	7.6107	1.1762	7.66488	7.66271
3 0	+7.9266	−7.6111	+1.1762	+7.66488	+7.66271

PATH OF THE SHADOW DURING THE TOTAL ECLIPSE OF THE SUN, 1914, AUGUST 20–21.

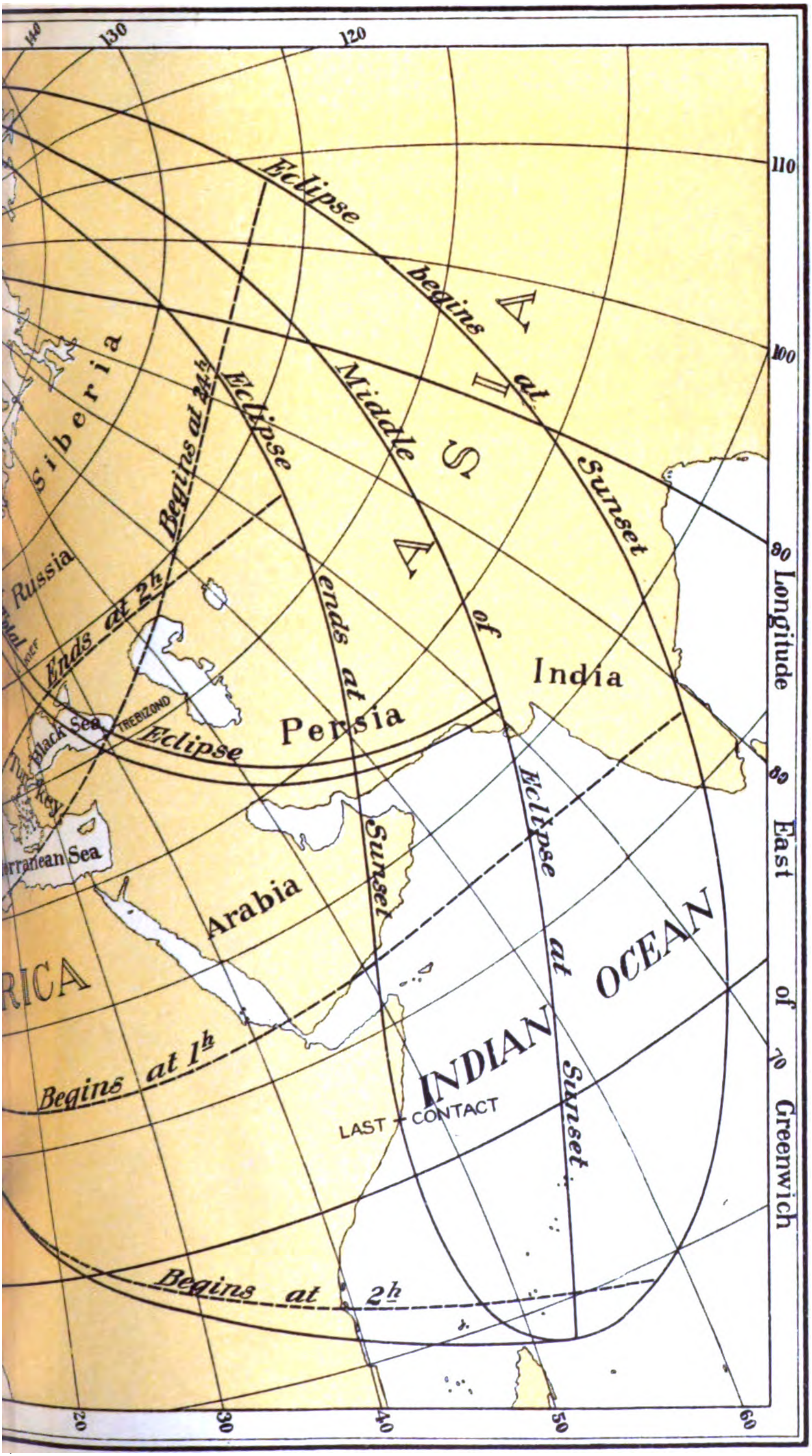
Greenwich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits.	+71 45.6	122 27.8 W.	+71 23.4	121 11.9 W.	+71 1.0	119 59.2 W.	. . .
23^h 30^m	77 58.2	87 45.4	77 52.8	80 36.8	77 36.6	74 15.9	1 25.3
35	79 10.3	54 14.1	78 28.0	50 1.3	77 43.5	46 29.3	1 35.6
40	78 3.8	30 28.1	77 12.0	28 45.9	76 20.5	27 21.2	1 43.2
45	76 6.8	14 55.2	75 15.0	14 36.8	74 23.9	14 22.9	1 49.5
50	73 53.4	4 30.0 W.	73 4.3	4 53.1 W.	72 15.9	5 15.6 W.	1 54.7
55	71 36.3	2 53.6 E.	70 50.4	2 10.0 E.	70 4.9	1 28.5 E.	1 59.2
0 0	+69 20.0	8 26.8	+68 37.2	7 32.6	+67 54.6	6 41.1	2 3.0
5	67 6.2	12 48.7	66 26.1	11 49.0	65 46.2	10 52.2	2 6.2
10	64 55.2	16 22.7	64 17.7	15 20.3	63 40.2	14 20.5	2 8.9
15	62 47.0	19 23.1	62 11.8	18 19.5	61 36.5	17 18.3	2 11.0
20	60 41.4	21 59.5	60 8.3	20 55.5	59 35.0	19 53.5	2 12.5
25	58 38.2	24 18.4	58 6.9	23 14.4	57 35.5	22 12.3	2 13.7
30	+56 36.8	26 24.5	+56 7.4	25 20.7	+55 37.6	24 18.7	2 14.3
35	54 37.2	28 21.4	54 9.3	27 17.9	53 41.2	26 16.0	2 14.5
40	52 38.8	30 11.7	52 12.5	29 8.5	51 45.8	28 7.0	2 14.3
45	50 41.4	31 57.8	50 16.5	30 55.0	49 51.3	29 53.7	2 13.6
50	48 44.5	33 41.8	48 21.1	32 39.2	47 57.3	31 38.1	2 12.4
55	46 48.0	35 25.6	46 25.9	34 23.2	46 3.5	33 22.1	2 10.7
1 0	+44 51.2	37 11.1	+44 30.5	36 8.6	+44 9.4	35 7.5	2 8.6
5	42 53.7	39 0.5	42 34.4	37 57.8	42 14.7	36 56.2	2 6.0
10	40 55.0	40 56.1	40 37.1	39 52.8	40 18.8	38 50.7	2 2.9
15	38 54.3	43 1.3	38 37.9	41 57.0	38 21.1	40 53.6	1 59.1
20	36 50.4	45 20.4	36 35.8	44 14.2	36 20.6	43 9.2	1 54.8
25	34 41.9	48 0.3	34 29.4	46 51.1	34 16.1	45 43.2	1 49.6
30	+32 25.9	51 13.1	+32 16.0	49 58.4	+32 5.2	48 45.8	1 43.4
35	29 56.1	55 25.6	29 50.3	53 59.7	29 43.1	52 37.3	1 35.7
40	26 49.5	62 18.6	26 55.2	60 11.2	26 56.7	58 18.1	1 24.8
Limits.	+24 15.3	70 55.7 E.	+23 44.7	70 35.8 E.	+23 14.3	70 16.3 E.	. . .

TOTAL ECLIPSE OF AU



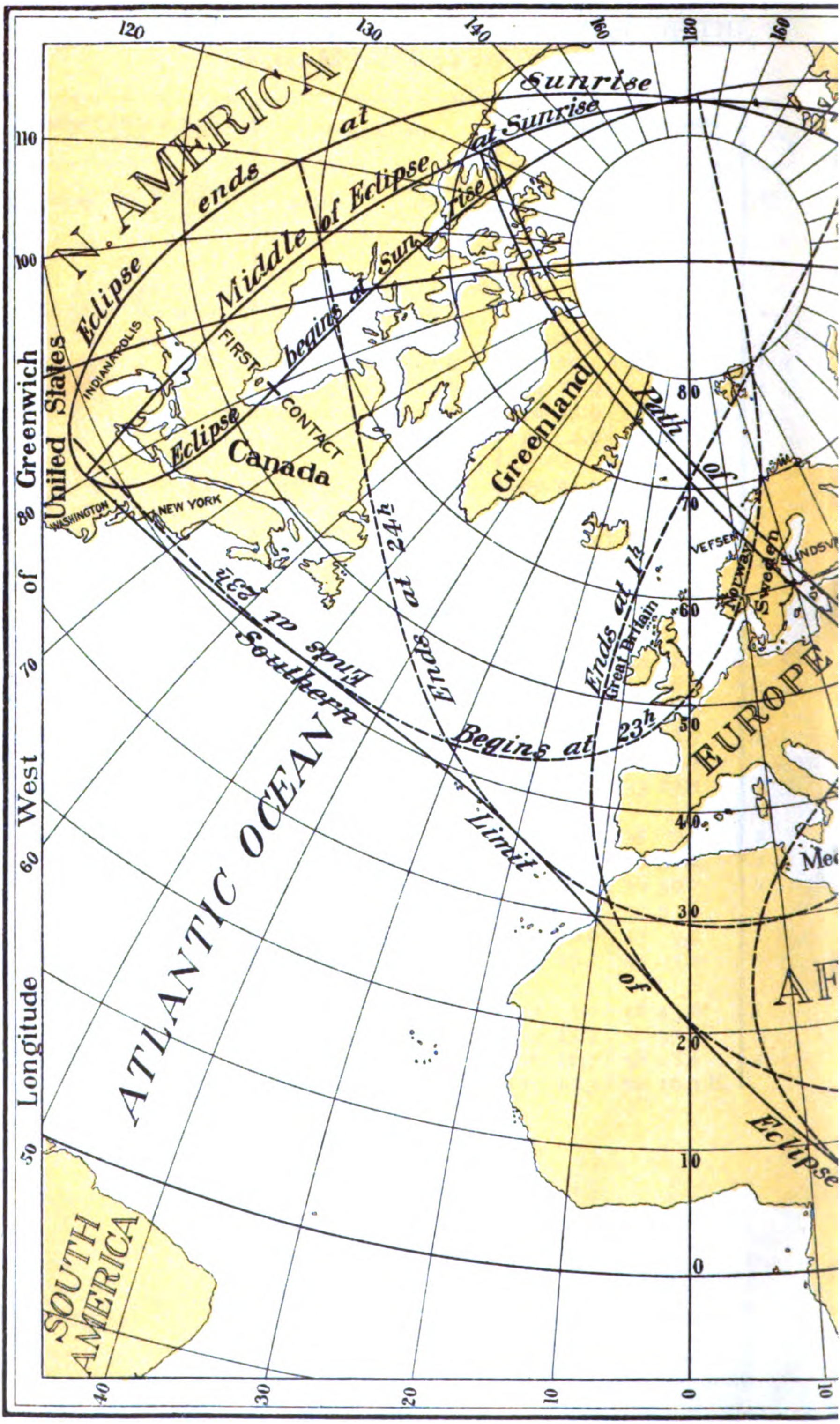
Note: *The hours of beginning and endir*

GUST 20TH—21ST, 1914.



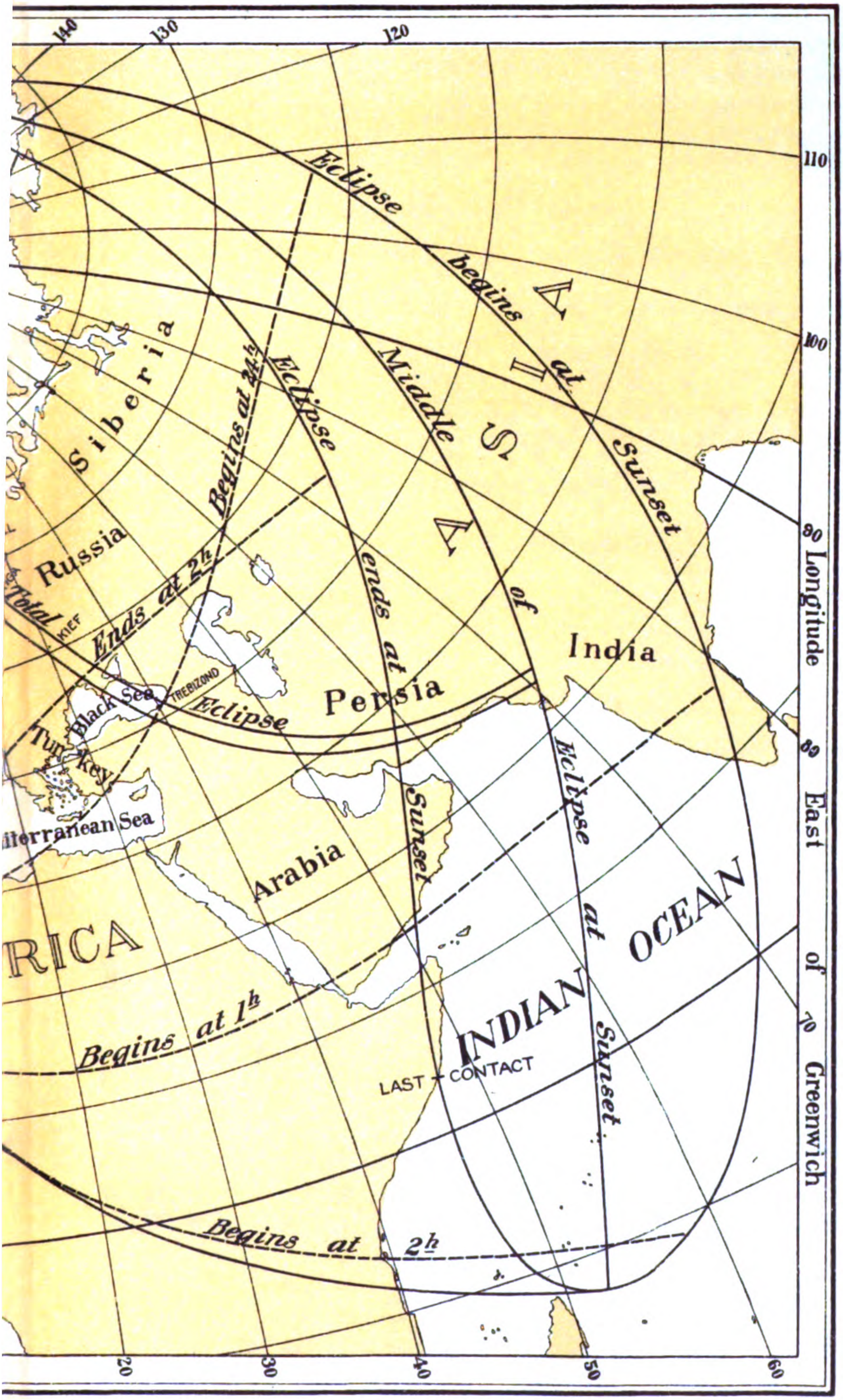
are expressed in Greenwich Mean Time.

TOTAL ECLIPSE OF AU



Note: *The hours of beginning and endin*

GUST 20TH–21ST, 1914.



g are expressed in Greenwich Mean Time.

A Transit of Mercury over the Sun's Disk, 1914, November 6–7, partly visible at Washington, the Sun rising with Mercury on its Disk. The ingress will be visible generally in western Australia, central and western Asia, Europe, Africa, and in South America, excepting the northwestern portion; the egress in southwest Europe, Africa, South America, and in North America, excepting the northwestern portion.

ELEMENTS OF THE TRANSIT.

	d	h	m	s
Greenwich mean time of conjunction in right ascension, November	6	23	11	38.7

Sun and Mercury's R. A.	14h 46m 58s.14	Hourly motions	+9s.98 and −12s.09
Sun's declination	16° 6′ 37″.7 S.	Hourly motion	0′ 44″.7 S.
Mercury's declination	16° 18′ 18″.0 S.	Hourly motion	1′ 48″.4 N.
Sun's equa. hor. parallax	8.88	Sun's true semidiameter	16 8.58
Mercury's equa. hor. parallax	13.04	Mercury's true semidiameter	4.95

GREENWICH MEAN TIME OF THE GEOCENTRIC PHASES.

		d	h	m	s
Ingress, exterior contact	November	6	21	57	14.2
Ingress, interior contact		6	21	59	27.3
Least distance of centers, 10′ 30″.9		7	0	3	20.4
Egress, interior contact		7	2	7	17.5
Egress, exterior contact		7	2	9	30.8

CIRCUMSTANCES OF THE TRANSIT.

	Angles of position from the north point.	Mercury being in the astronomical zenith in longitude from Greenwich.	and in latitude.
	° ′	° ′	° ′
Ingress, exterior contact	156 7 E.	26 44 E.	16 21 S.
Ingress, interior contact	156 37 E.	26 11 E.	16 20 S.
Least distance of centers		4 59 W.	16 17 S.
Egress, interior contact	105 10 W.	36 10 W.	16 13 S.
Egress, exterior contact	104 40 W.	36 43 W.	16 13 S.

The Greenwich mean times of the four contacts for any point on the surface of the Earth may be computed from the four following formulæ, respectively, in which ρ denotes the radius of the earth at that point, φ' the geocentric north latitude, and λ the longitude *west* from Greenwich. The numbers in brackets are the logarithms of the respective coefficients.

$$\text{Ing. ext. } T^{I} = 21^{h}\ 57^{m}\ 14^{s}.2 + [1.6875]\rho\sin\varphi' - [1.4317]\rho\cos\varphi'\cos(209^{\circ}\ 53'.3 - \lambda)$$

$$\text{Ing. int. } T^{II} = 21\ 59\ 27.3 + [1.6925]\rho\sin\varphi' - [1.4294]\rho\cos\varphi'\cos(209\ 49.7 - \lambda)$$

$$\text{Eg. int. } T^{III} = 2\ 7\ 17.5 - [1.1426]\rho\sin\varphi' + [1.7346]\rho\cos\varphi'\cos(131\ 2.8 - \lambda)$$

$$\text{Eg. ext. } T^{IV} = 2\ 9\ 30.8 - [1.1248]\rho\sin\varphi' + [1.7322]\rho\cos\varphi'\cos(131\ 27.5 - \lambda)$$

MEAN PLACES FOR 1914.0. (January 0^d.490, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
51 Piscium	5.6	0 27 57.477	+0.0021	+ 6 28 50.46	+0.009
136 B. Piscium	6.5	0 36 45.158	−0.0084	8 53 9.12	−0.082
60 Piscium	6.2	0 42 56.678	+0.0010	6 16 18.66	−0.005
62 Piscium	6.1	0 43 49.600	+0.0070	6 49 50.16	+0.008
δ Piscium	4.6	0 44 13.141	+0.0055	7 7 2.10	−0.044
η Piscium	3.7	1 26 52.718	+0.0015	+14 54 10.22	−0.003
101 Piscium	6.2	1 31 10.410	+0.0010	14 13 19.72	−0.002
4 Arietis	5.8	1 43 30.868	+0.0035	16 31 40.19	−0.021
ι Arietis	5.1	1 52 38.961	+0.0021	17 23 53.05	−0.020
35 B. Arietis	6.4	1 58 59.409	−0.0008	17 50 25.40	−0.018
47 B. Arietis	6.5	2 3 2.423	−0.0037	+17 37 12.55	−0.007
20 H^1. Arietis	6.4	2 4 39.467	+0.0112	16 49 17.09	−0.179
θ Arietis	5.6	2 13 20.338	−0.0007	19 30 13.82	−0.003
26 Arietis	6.2	2 25 48.833	+0.0050	19 28 27.07	−0.022
μ Arietis	5.7	2 37 30.843	+0.0023	19 38 44.52	−0.038
47 Arietis	5.8	2 53 9.675	+0.0160	+20 19 28.47	−0.021
ε Arietis (*mean*)	4.6	2 54 17.459	−0.0009	20 59 49.15	−0.010
64 Arietis	5.8	3 19 13.555	+0.0013	24 25 12.76	−0.046
66 Arietis	6.1	3 23 24.768	+0.0006	22 30 29.79	−0.112
7 Tauri	5.9	3 29 20.860	+0.0013	24 10 36.22	−0.023
11 Tauri	6.1	3 35 37.933	+0.0014	+25 3 7.88	−0.008
16 Tauri	5.4	3 39 41.277	+0.0009	24 1 10.77	−0.049
17 Tauri	3.8	3 39 45.928	+0.0016	23 50 37.30	−0.050
18 Tauri	5.6	3 40 1.629	+0.0004	24 34 13.03	−0.038
q Tauri	4.3	3 40 5.100	+0.0010	24 11 54.13	−0.034
20 Tauri	4.1	3 40 42.380	+0.0016	+24 5 59.30	−0.044
21 Tauri	5.8	3 40 46.855	+0.0012	24 17 12.56	−0.046
22 Tauri	6.5	3 40 55.298	+0.0006	24 15 37.33	−0.039
23 Tauri	4.3	3 41 13.127	+0.0017	23 40 52.12	−0.050
η Tauri	3.0	3 42 22.158	+0.0016	23 50 23.90	−0.050
27 Tauri	3.7	3 44 2.727	+0.0013	+23 47 28.44	−0.048
28 Tauri	5.2	3 44 4.011	+0.0009	23 52 29.07	−0.046
14 H. Tauri	5.3	3 45 8.538	+0.0033	25 19 14.86	−0.103
p Tauri	5.6	4 5 35.430	−0.0024	26 15 26.43	−0.042
φ Tauri	5.0	4 15 3.704	−0.0019	27 8 44.96	−0.082
χ Tauri	5.3	4 17 20.812	+0.0028	+25 25 37.77	−0.039
5 B. Aurigæ	5.7	4 35 56.692	+0.0036	28 26 56.80	−0.047
17 B. Aurigæ	6.0	4 47 24.675	+0.0033	27 45 16.03	−0.037
38 B. Aurigæ	6.5	4 59 15.195	−0.0001	27 34 36.23	−0.075
47 B. Aurigæ	6.0	5 4 20.863	. . . .	27 55 22.38	. . .
354 B. Tauri	6.4	5 15 35.201	−0.0027	+27 52 15.69	−0.015
73 B. Aurigæ	5.8	5 15 44.389	+0.0004	29 29 0.65	−0.011
22 Aurigæ	6.4	5 17 55.998	+0.0017	28 51 20.54	−0.031
β Tauri	1.8	5 20 51.261	+0.0025	28 32 8.85	−0.177
107 B. Aurigæ	6.5	5 30 31.642	−0.0013	27 36 25.07	−0.076
112 B. Aurigæ	5.7	5 31 46.484	−0.0004	+26 52 16.91	−0.040
116 B. Aurigæ	5.9	5 33 50.163	+0.0012	29 9 59.65	−0.010
406 B. Tauri	5.6	5 45 32.866	−0.0013	27 56 35.27	+0.011
136 Tauri	4.6	5 47 55.340	+0.0013	27 35 34.19	−0.020
154 B. Aurigæ	6.4	5 51 5.984	. . . .	28 55 46.41	. . .
415 B. Tauri	6.1	5 55 36.285	+0.0018	+27 34 7.59	−0.001
183 B. Aurigæ	6.3	6 0 53.026	. . . .	29 31 12.67	. . .
κ Aurigæ	4.4	6 9 53.950	−0.0044	29 31 50.77	−0.263
211 B. Aurigæ	6.3	6 15 42.540	. . . .	29 34 51.12	. . .
49 Aurigæ	5.1	6 29 47.134	−0.0001	28 5 24.82	−0.027
53 Aurigæ	5.6	6 32 55.825	−0.0019	+29 3 32.37	−0.022
54 Aurigæ	5.8	6 34 7.755	−0.0012	28 20 23.84	−0.025
28 Geminorum	5.5	6 39 18.570	−0.0001	+29 3 31.95	−0.026

MEAN PLACES FOR 1914.0. (January 0^d.490, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
		h	m	s	s	°	′	″	″
39 Geminorum	6.2	6	53	29.486	−0.0117	+26	11	41.75	+0.086
40 Geminorum	6.3	6	54	9.388	−0.0012	26	1	54.45	−0.015
47 Geminorum	5.6	7	6	3.155	−0.0011	26	59	55.32	−0.051
52 Geminorum	6.1	7	9	26.479	+0.0038	25	2	7.31	−0.086
53 Geminorum	5.9	7	10	35.018	−0.0008	28	2	52.60	−0.002
134 B. Geminorum	6.5	7	11	43.876	+0.0058	+26	50	43.03	−0.134
A Geminorum	5.1	7	18	14.014	−0.0051	25	13	0.20	−0.014
59 Geminorum	5.7	7	19	12.492	+0.0010	27	48	18.27	+0.019
υ Geminorum	4.3	7	30	37.540	−0.0016	27	5	15.93	−0.109
176 B. Geminorum	6.3	7	33	2.326	+0.0038	24	33	12.86	−0.029
181 B. Geminorum	6.0	7	34	0.348	−0.0006	+24	25	4.97	−0.029
c Geminorum	5.5	7	38	52.274	−0.0017	25	59	22.10	−0.028
κ Geminorum	3.7	7	39	15.496	−0.0014	24	36	18.14	−0.060
82 Geminorum	6.3	7	43	25.209	−0.0010	23	21	16.67	−0.001
ω Cancri	5.9	7	55	43.773	+0.0003	25	37	44.57	−0.004
5 B. Cancri	6.4	7	55	52.839	−0.0003	+23	49	12.63	−0.047
4 Cancri	6.2	7	56	32.705	−0.0012	25	19	37.19	+0.007
9 Cancri	6.2	8	1	12.697	−0.0009	22	52	54.27	−0.018
35 B. Cancri	6.4	8	8	36.132	−0.0017	23	23	49.97	−0.022
λ Cancri	5.9	8	15	25.503	−0.0011	24	17	37.97	−0.028
η Cancri	5.5	8	27	44.286	−0.0025	+20	44	2.44	−0.055
39 Cancri	6.5	8	35	9.751	−0.0027	20	18	43.57	−0.016
40 Cancri	6.5	8	35	14.912	−0.0014	20	16	32.72	−0.003
102 B. Cancri	6.5	8	35	25.937	−0.0048	19	58	29.21	−0.010
ε Cancri	6.3	8	35	31.275	−0.0007	19	50	58.76	−0.027
γ Cancri	4.7	8	38	18.724	−0.0071	+21	46	42.63	−0.043
139 B. Cancri	6.1	8	45	51.541	−0.0011	19	9	14.13	−0.001
12 B. Leonis	6.3	9	20	46.918	−0.0042	16	57	26.20	−0.014
7 Leonis	6.2	9	31	11.057	−0.0021	14	45	50.12	−0.002
8 Leonis	5.9	9	32	18.049	−0.0006	16	49	25.25	−0.015
11 Leonis	6.5	9	33	19.824	−0.0047	+14	44	11.39	−0.079
ψ Leonis	5.6	9	39	3.017	−0.0002	14	24	55.94	−0.009
ν Leonis	5.0	9	53	35.846	−0.0028	12	51	19.27	−0.027
α Leonis	1.3	10	3	47.626	−0.0169	12	23	16.58	−0.002
34 Leonis	6.4	10	7	0.893	+0.0037	13	46	48.54	−0.035
44 Leonis	5.9	10	20	43.423	+0.0018	+ 9	13	20.57	−0.041
45 Leonis	5.8	10	23	6.552	+0.0011	10	12	4.37	−0.003
ρ Leonis	3.8	10	28	17.074	−0.0004	9	44	58.34	−0.003
48 Leonis	5.2	10	30	18.908	−0.0072	7	23	48.26	+0.046
49 Leonis	5.7	10	30	31.553	−0.0030	9	5	42.11	−0.010
37 Sextantis	6.3	10	41	37.074	−0.0010	+ 6	49	36.01	−0.040
56 Leonis	6.1	10	51	33.629	−0.0013	6	38	40.73	−0.008
c Leonis	5.1	10	56	17.400	−0.0035	6	33	49.64	−0.025
χ Leonis	4.7	11	0	34.917	−0.0234	7	48	4.64	−0.041
75 Leonis	5.4	11	12	51.875	+0.0027	2	29	1.16	−0.145
76 Leonis	6.0	11	14	30.145	−0.0038	+ 2	7	19.75	−0.053
79 Leonis	5.5	11	19	37.557	−0.0014	1	52	48.08	+0.003
80 Leonis	6.4	11	21	24.933	−0.0051	4	20	1.33	−0.050
83 Leonis	6.3	11	22	24.115	−0.0492	3	28	55.52	+0.187
τ Leonis	5.2	11	23	30.899	+0.0008	3	19	48.10	−0.016
89 Leonis	5.7	11	29	57.909	−0.0121	+ 3	32	16.64	−0.104
υ Leonis	4.5	11	32	32.727	0.0000	− 0	20	55.75	+0.039
9 B. Virginis	6.2	11	44	38.148	−0.0148	+ 0	9	33.52	+0.007
31 B. Virginis	6.4	11	56	37.608	−0.0006	− 1	17	15.11	−0.075
78 B. Virginis	6.5	12	9	51.102	−0.0051	5	14	27.88	+0.114
162 B. Virginis	6.2	12	23	26.771	−0.0062	− 4	8	22.19	−0.003
200 B. Virginis	6.3	12	27	13.373	−0.0022	4	34	41.65	+0.035
f Virginis	6.0	12	32	21.508	−0.0021	− 5	21	28.93	−0.027

MEAN PLACES FOR 1914.0. (January 0^d.490, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
χ Virginis	4.8	12 34 48.355	−0.0056	− 7 31 20.80	−0.031
319 B. Virginis	6.3	12 43 6.661	−0.0003	5 49 52.44	−0.053
ψ Virginis	5.0	12 49 52.720	−0.0024	9 4 19.63	−0.028
49 Virginis	5.2	13 3 23.359	+0.0007	10 16 50.99	−0.014
g Virginis	5.6	13 4 3.348	−0.0011	8 31 26.04	−0.074
50 Virginis	6.2	13 5 15.145	+0.0003	− 9 52 15.03	−0.017
α Virginis	1.2	13 20 39.619	−0.0028	10 42 45.65	−0.032
i Virginis	5.7	13 22 10.413	−0.0096	12 15 37.29	−0.023
75 Virginis	5.6	13 28 15.806	−0.0050	14 55 15.01	+0.004
550 B. Virginis	6.0	13 30 5.981	−0.0040	12 46 24.88	−0.014
83 Virginis	5.6	13 39 51.241	+0.0007	−15 44 48.89	−0.011
85 Virginis	6.1	13 40 57.092	−0.0029	15 20 8.70	−0.034
214 G. Virginis	6.5	14 0 32.536	−0.0036	15 55 28.27	−0.012
40 H. Virginis	5.1	14 6 8.513	+0.0003	15 53 46.30	−0.014
43 H. Virginis	5.5	14 10 39.562	−0.0031	17 47 59.54	−0.015
231 G. Virginis	6.4	14 12 18.323	−0.0005	−18 11 10.05	+0.106
236 G. Virginis	5.7	14 13 52.765	−0.0039	18 19 4.33	−0.001
9 G. Libræ	6.5	14 30 0.244	+0.0032	20 3 44.61	−0.004
17 G. Libræ	6.4	14 41 18.018	−0.0047	20 48 42.61	−0.112
18 G. Libræ	6.1	14 42 20.075	−0.0032	20 57 52.59	−0.014
43 B. Libræ	5.7	14 52 26.450	+0.0745	−21 1 43.25	−1.793
47 G. Libræ	6.1	15 1 29.283	+0.0065	21 41 52.02	−0.051
64 G. Libræ	5.8	15 11 23.692	−0.0028	22 4 54.20	+0.018
153 B. Libræ	6.3	15 28 3.469	−0.0006	24 11 52.77	−0.042
169 B. Libræ	6.0	15 32 44.512	−0.0017	22 51 24.64	−0.068
42 Libræ	5.0	15 35 11.643	−0.0018	−23 32 21.40	−0.027
b Scorpii	4.7	15 45 48.176	−0.0024	25 29 26.54	−0.044
A Scorpii	4.6	15 48 26.726	−0.0017	25 4 15.50	−0.023
31 B. Scorpii	5.4	15 48 45.447	−0.0022	24 16 39.68	−0.037
3 Scorpii	5.9	15 49 29.488	−0.0031	24 59 22.09	−0.029
4 Scorpii	5.7	15 50 18.041	−0.0038	−26 0 47.25	−0.028
40 B. Scorpii	5.4	15 53 25.200	−0.0031	24 35 2.08	+0.004
π Scorpii	3.0	15 53 38.770	−0.0010	25 52 2.48	−0.045
48 B. Scorpii	4.9	15 58 8.631	−0.0048	25 37 34.66	−0.043
50 B. Scorpii	6.4	15 58 44.724	+0.0017	24 29 23.47	−0.032
65 B. Scorpii	5.5	16 2 53.009	+0.0095	−26 5 48.09	+0.023
85 B. Scorpii	6.0	16 9 40.579	−0.0005	25 15 33.52	+0.012
σ Scorpii	3.1	16 15 57.496	−0.0011	25 23 14.36	+0.039
α Scorpii	1.2	16 24 7.900	−0.0006	26 14 31.27	−0.028
116 B. Scorpii	6.2	16 26 6.037	−0.0013	26 21 4.36	−0.037
τ Scorpii	2.9	16 30 31.553	−0.0013	−28 2 18.68	−0.034
134 B. Scorpii	6.4	16 38 57.193	+0.0012	27 17 43.75	−0.014
135 B. Scorpii	6.0	16 39 37.379	−0.0016	28 21 0.84	+0.008
95 G. Ophiuchi	6.1	17 7 1.936	+0.0008	27 39 23.69	−0.039
43 Ophiuchi	5.4	17 17 56.747	−0.0002	28 3 37.65	−0.040
163 G. Ophiuchi	6.3	17 37 52.798	+0.0002	−27 50 36.55	−0.017
X Sagittarii (*var.*)	4.4	17 42 8.806	+0.0002	27 47 56.20	−0.015
4 G. Sagittarii	6.2	17 43 5.114	−0.0004	26 56 43.03	−0.030
10 G. Sagittarii	5.7	17 51 16.029	+0.0024	28 3 7.05	+0.015
210 B. Scorpii	5.8	17 53 11.769	+0.0028	28 45 0.72	+0.005
W Sagittarii (*var.*)	4.3	17 59 31.591	+0.0007	−29 35 5.21	−0.015
38 B. Sagittarii	4.7	18 2 38.160	+0.0016	28 28 2.61	−0.020
C. D.−28° 14268	6.4	18 6 30.200	−0.0002	28 55 14.70	−0.019
48 G. Sagittarii	6.3	18 11 56.747	+0.0093	28 19 0.80	−0.234
62 B. Sagittarii	6.0	18 11 57.218	+0.0053	28 40 54.03	+0.032
66 B. Sagittarii	4.7	18 12 40.198	0.0000	−27 4 27.71	+0.015
58 G. Sagittarii	6.1	18 16 33.709	+0.0028	28 28 11.58	+0.005
68 G. Sagittarii	6.2	18 22 22.080	0.0000	26 41 11.50	−0.046
69 G. Sagittarii	6.3	18 22 44.317	+0.0018	−26 48 34.05	−0.032

MEAN PLACES FOR 1914.0. (January 0^d.490, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
86 B. Sagittarii . . .	6.5	18 23 35.546	−0.0063	−26 38 14.44	−0.054
φ Sagittarii . . .	3.3	18 40 17.018	+0.0034	27 4 48.32	−0.006
σ Sagittarii . . .	2.1	18 49 55.954	−0.0003	26 24 16.45	−0.075
τ Sagittarii . . .	3.5	19 1 34.329	−0.0046	27 47 49.38	−0.254
201 B. Sagittarii . . .	5.9	19 7 55.909	−0.0015	26 3 6.84	−0.018
ψ Sagittarii . . .	4.9	19 10 16.088	+0.0025	−25 24 21.02	−0.035
χ Sagittarii . . .	4.9	19 20 2.579	+0.0033	24 40 35.02	−0.063
248 B. Sagittarii . . .	5.7	19 24 33.108	+0.0017	27 9 43.52	−0.014
51 Sagittarii . . .	5.8	19 30 48.461	+0.0004	24 54 29.03	−0.005
h Sagittarii . . .	4.7	19 31 28.500	+0.0044	25 4 27.50	−0.027
308 B. Sagittarii . . .	6.3	19 49 8.884	−0.0094	−24 9 21.14	−0.438
329 B. Sagittarii . . .	6.1	19 56 17.361	+0.0010	22 58 27.87	−0.005
336 B. Sagittarii . . .	6.5	19 58 38.663	−0.0019	22 50 14.40	+0.052
4 Capricorni . .	5.7	20 12 58.312	+0.0012	22 4 34.83	−0.032
36 B. Capricorni . .	6.2	20 24 28.697	+0.0003	22 40 38.61	−0.027
17 Capricorni . .	5.8	20 41 10.974	+0.0011	−21 49 38.10	−0.014
19 Capricorni . .	5.7	20 49 56.392	−0.0041	18 14 58.60	−0.013
20 Capricorni . .	6.2	20 54 43.074	+0.0012	19 22 9.67	−0.020
21 Capricorni . .	6.5	20 56 1.490	−0.0025	17 52 0.27	−0.002
η Capricorni . .	4.8	20 59 30.772	−0.0025	20 11 45.08	−0.047
θ Capricorni . .	4.2	21 1 6.876	+0.0050	−17 34 31.09	−0.066
27 Capricorni . .	6.1	21 4 38.130	+0.0085	20 54 8.33	−0.123
114 B. Capricorni . .	6.1	21 10 18.031	−0.0011	17 42 4.36	. . .
30 Capricorni . .	5.4	21 13 8.071	+0.0015	18 20 45.84	−0.002
31 Capricorni . .	6.3	21 13 27.091	+0.0031	17 49 24.94	+0.006
ι Capricorni . .	4.3	21 17 27.619	+0.0022	−17 12 4.98	+0.004
γ Capricorni . .	3.8	21 35 19.695	+0.0129	17 3 4.40	−0.017
42 Capricorni . .	5.1	21 36 52.419	−0.0084	14 25 53.54	−0.302
44 Capricorni . .	6.0	21 38 22.986	−0.0005	14 47 36.16	+0.024
45 Capricorni . .	5.8	21 39 19.368	−0.0013	15 8 38.69	−0.002
δ Capricorni . .	3.0	21 42 17.756	+0.0176	−16 31 4.99	−0.297
151 B. Capricorni . .	6.1	21 45 2.268	−0.0009	13 7 26.77	+0.031
μ Capricorni . .	5.2	21 48 36.522	+0.0204	13 57 25.96	+0.001
ι Aquarii . . .	4.4	22 1 47.635	+0.0022	14 17 14.54	−0.062
e Aquarii . . .	5.4	22 6 1.708	+0.0019	11 59 17.53	+0.020
42 Aquarii . . .	5.5	22 12 11.887	+0.0010	−13 15 38.50	+0.009
σ Aquarii . . .	4.9	22 26 5.859	0.0000	11 7 5.96	−0.016
58 Aquarii . . .	6.4	22 27 7.854	+0.0050	11 20 47.43	−0.032
167 G. Aquarii . . .	6.3	22 33 51.333	+0.0010	8 20 40.32	+0.012
213 B. Aquarii . . .	6.5	22 38 33.135	+0.0014	8 45 42.15	+0.011
67 Aquarii . . .	6.4	22 38 44.877	+0.0015	− 7 24 48.29	−0.007
λ Aquarii . . .	3.8	22 48 7.720	+0.0002	8 2 15.02	+0.035
78 Aquarii . . .	6.3	22 50 5.455	−0.0017	7 39 43.16	−0.029
252 B. Aquarii . . .	5.8	22 50 43.307	−0.0003	5 26 45.80	+0.009
197 G. Aquarii . . .	6.3	22 52 50.067	−0.0024	5 16 11.67	+0.006
81 Aquarii . . .	6.4	22 56 55.518	−0.0015	− 7 31 23.26	−0.001
263 B. Aquarii . . .	6.1	22 57 4.703	+0.0007	5 10 26.10	+0.002
82 Aquarii . . .	6.4	22 58 4.777	0.0000	7 2 9.72	−0.034
φ Aquarii . . .	4.4	23 9 52.128	+0.0015	6 30 46.19	−0.194
293 B. Aquarii . . .	5.5	23 11 8.468	−0.0011	3 57 54.97	+0.003
96 Aquarii . . .	5.7	23 14 56.439	+0.0128	− 5 35 39.64	−0.010
316 B. Aquarii . . .	6.5	23 15 48.345	+0.0191	4 23 15.43	−0.118
13 Piscium . . .	6.4	23 27 32.794	+0.0003	1 33 39.15	+0.023
14 Piscium . . .	5.9	23 29 43.720	+0.0073	− 1 43 21.18	−0.005
λ Piscium . . .	4.6	23 37 39.478	−0.0092	+ 1 18 23.94	−0.154
21 Piscium . . .	5.6	23 45 3.276	+0.0002	+ 0 35 54.80	−0.033
22 Piscium . . .	5.8	23 47 33.650	+0.0009	2 27 8.31	−0.011
25 Piscium . . .	6.2	23 48 40.440	+0.0003	+ 1 36 44.92	−0.004
60 B. Piscium . . .	6.0	23 50 22.512	−0.0023	− 0 22 8.51	−0.013

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
213 B. Aquarii	6.5	−0.36	− 5.6	− 8 45.8	0 19 39.3	− 8 17.9	−0.8009	0.4918	+0.2497	+ 1	−90
λ Aquarii	3.8	0.32	5.1	8 2.3	1 0 57.0	− 3 8.9	−0.2673	0.4893	0.2525	+29	−59
78 Aquarii	6.3	0.31	4.9	7 39.8	2 2.5	− 2 5.3	−0.4044	0.4888	0.2530	+22	−67
81 Aquarii	6.4	0.28	4.7	7 31.5	5 51.5	+ 1 37.6	+0.4116	0.4872	0.2546	+66	−23
82 Aquarii	6.4	0.28	4.5	7 2.2	6 30.4	+ 2 15.4	+0.0404	0.4869	0.2548	+45	−42
φ Aquarii	4.4	−0.22	− 4.0	− 6 30.8	13 9.0	+ 8 43.3	+1.1657	0.4845	+0.2571	+83	+21
96 Aquarii	5.7	0.20	3.5	5 35.7	16 1.5	+11 31.2	+0.8941	0.4837	0.2578	+84	+ 2
316 B. Aquarii	6.5	0.20	3.1	4 23.3	16 31.0	+11 59.9	−0.3099	0.4835	0.2580	+28	−62
14 Piscium	5.9	0.15	1.7	1 43.4	2 0 27.7	− 4 15.9	−1.1968	0.4816	0.2594	−24	−90
60 B. Piscium	6.0	−0.06	− 0.5	− 0 22.2	12 19.4	+ 7 17.0	+0.3889	0.4801	0.2600	+66	−24
60 Piscium	6.2	+0.18	+ 3.7	+ 6 16.4	3 18 29.3	−11 20.7	+0.8092	0.4833	+0.2530	+90	− 1
62 Piscium	6.1	0.18	3.9	6 49.9	18 59.3	−10 51.5	+0.3179	0.4835	0.2528	+62	−27
δ Piscium	4.6	0.18	4.0	7 7.1	19 12.7	−10 38.4	+0.0571	0.4835	0.2527	+47	−40
101 Piscium	6.2	0.40	8.0	14 13.5	4 21 18.8	− 9 15.1	−1.3787	0.4947	0.2363	−47	−76
47 B. Arietis	6.5	0.57	9.8	17 37.4	5 14 14.7	+ 7 11.8	−1.2386	0.5055	0.2198	−31	−72
20 H¹. Arietis	6.4	+0.59	+ 9.6	+16 49.4	15 5.1	+ 8 0.7	−0.1790	0.5061	+0.2188	+35	−46
26 Arietis	6.2	0.71	10.8	19 28.6	6 1 53.1	− 5 30.7	−0.7856	0.5143	0.2054	+ 2	−71
μ Arietis	5.7	0.78	11.0	19 38.9	7 42.6	+ 0 8.1	+0.2009	0.5191	0.1972	+56	−24
47 Arietis	5.8	0.88	11.3	20 19.7	15 20.2	+ 7 31.2	+0.9206	0.5257	0.1854	+90	+16
ε Arietis (*mean*)	4.6	0.88	11.6	21 0.0	15 52.8	+ 8 2.8	+0.2910	0.5261	0.1845	+61	−18
66 Arietis	6.1	+1.06	+12.0	+22 30.7	7 5 34.0	− 2 42.8	+1.0129	0.5384	+0.1599	+90	+25
7 Tauri	5.9	1.10	12.5	24 10.8	8 16.8	− 0 5.5	−0.3590	0.5408	0.1545	+24	−48
11 Tauri	6.1	1.14	12.6	25 3.3	11 7.8	+ 2 39.6	−0.8684	0.5434	0.1487	− 5	−65
16 Tauri	5.4	1.16	12.3	24 1.4	12 57.2	+ 4 25.3	+0.5098	0.5451	0.1449	+78	− 2
17 Tauri	3.8	1.16	12.3	23 50.8	12 59.3	+ 4 27.3	+0.7039	0.5451	0.1448	+90	+ 8
18 Tauri	5.6	+1.16	+12.5	+24 34.4	13 6.4	+ 4 34.3	−0.0600	0.5453	+0.1446	+41	−31
q Tauri	4.3	1.16	12.4	24 12.1	13 7.9	+ 4 35.7	+0.3434	0.5453	0.1445	+65	−10
20 Tauri	4.1	1.17	12.4	24 6.2	13 24.6	+ 4 51.8	+0.4895	0.5455	0.1439	+76	− 3
21 Tauri	5.8	1.17	12.4	24 17.4	13 26.6	+ 4 53.7	+0.2933	0.5456	0.1439	+62	−13
22 Tauri	6.5	1.17	12.4	24 15.8	13 30.4	+ 4 57.4	+0.3308	0.5456	0.1437	+65	−11
23 Tauri	4.3	+1.17	+12.2	+23 41.1	13 38.4	+ 5 5.1	+0.9721	0.5457	+0.1434	+90	+25
η Tauri	3.0	1.18	12.3	23 50.6	14 9.3	+ 5 34.9	+0.8748	0.5462	0.1423	+90	+19
27 Tauri	3.7	1.18	12.2	23 47.7	14 54.1	+ 6 18.1	+1.0327	0.5468	0.1407	+90	+29
28 Tauri	5.2	1.18	12.3	23 52.7	14 54.7	+ 6 18.7	+0.9444	0.5468	0.1407	+90	+23
14 H. Tauri	5.3	1.20	12.6	25 19.5	15 23.5	+ 6 46.5	−0.5409	0.5473	0.1397	+14	−57
p Tauri	5.6	+1.32	+12.6	+26 15.6	8 0 21.8	− 8 34.1	−0.3789	0.5552	+0.1192	+23	−45
φ Tauri	5.0	1.38	12.6	27 9.0	4 26.2	− 4 38.6	−0.8601	0.5587	0.1094	− 6	−63
χ Tauri	5.3	1.38	12.2	25 25.8	5 24.7	− 3 42.2	+1.0773	0.5595	0.1069	+90	+36
17 B. Aurigæ	6.0	1.56	11.9	27 45.5	18 0.5	+ 8 25.7	−0.2545	0.5693	0.0739	+29	−34
38 B. Aurigæ	6.5	1.62	11.5	27 34.8	22 51.7	−10 54.2	+0.2596	0.5727	0.0604	+60	− 7
47 B. Aurigæ	6.0	+1.65	+11.4	+27 55.6	9 0 56.0	− 8 54.6	+0.0134	0.5740	+0.0545	+45	−18
354 B. Tauri	6.4	1.70	11.0	27 52.4	5 28.3	− 4 32.8	+0.2853	0.5767	0.0413	+62	− 3
22 Aurigæ	6.4	1.72	11.0	28 51.5	6 24.9	− 3 38.4	−0.7123	0.5772	0.0386	+ 3	−60
β Tauri	1.8	1.73	10.8	28 32.3	7 35.2	− 2 30.9	−0.3326	0.5779	0.0351	+25	−35
107 B. Aurigæ	6.5	1.76	10.3	27 36.6	11 26.8	+ 1 11.7	+0.7552	0.5799	0.0236	+90	+23
116 B. Aurigæ	5.9	+1.80	+10.4	+29 10.2	12 45.7	+ 2 27.5	−0.8509	0.5805	+0.0196	− 6	−61
406 B. Tauri	5.6	1.83	9.7	27 56.7	17 23.8	+ 6 54.7	+0.4881	0.5824	0.0055	+78	+10
136 Tauri	4.6	1.83	9.6	27 35.7	18 20.0	+ 7 48.6	+0.8575	0.5827	+0.0026	+90	+31
154 B. Aurigæ	6.4	1.86	9.6	28 55.9	19 35.1	+ 9 0.8	−0.5375	0.5831	−0.0012	+14	−46
415 B. Tauri	6.1	1.86	9.2	27 34.3	21 21.4	+10 42.9	+0.8751	0.5837	0.0067	+90	+32
183 B. Aurigæ	6.3	+1.91	+ 9.2	+29 31.4	23 25.7	−11 17.8	−1.1791	0.5843	−0.0132	−35	−60
κ Aurigæ	4.4	1.94	8.7	29 32.0	10 2 57.5	− 7 54.4	−1.2535	0.5851	0.0241	−49	−60
49 Aurigæ	5.1	1.98	7.5	28 5.5	10 43.2	− 0 27.3	−0.0373	0.5862	0.0484	+42	−20
53 Aurigæ	5.6	2.00	7.4	29 3.7	11 56.8	+ 0 43.3	−1.1015	0.5862	0.0522	−26	−61
54 Aurigæ	5.8	1.99	7.3	28 20.5	12 24.8	+ 1 10.1	−0.3819	0.5863	0.0537	+23	−39
28 Geminorum	5.5	+2.02	+ 7.0	+29 3.6	14 25.9	+ 3 6.5	−1.2392	0.5863	−0.0599	−44	−61

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
Mars	−1.2	. . .	. . .	+26 52.4	10 20 40.3	+ 9 5.9	+0.5877	0.6043	−0.0814	+87	+ 9
47 Geminorum	5.6	+2.03	+5.3	27 0.0	11 0 52.1	−10 52.5	+0.0950	0.5852	0.0920	+50	−17
53 Geminorum	5.9	2.06	5.1	28 3.0	2 38.5	− 9 10.3	−1.1512	0.5849	0.0973	−30	−62
134 B. Geminorum	6.5	2.04	5.0	26 50.8	3 5.5	− 8 44.4	+0.0409	0.5848	0.0987	+47	−20
59 Geminorum	5.7	2.06	4.6	27 48.4	6 1.5	− 5 55.3	−1.2461	0.5840	0.1074	−43	−62
υ Geminorum	4.3	+2.06	+3.8	+27 5.3	10 31.2	− 1 36.4	−1.0208	0.5827	−0.1206	−17	−63
c Geminorum	5.5	2.05	3.3	25 59.4	13 46.8	+ 1 31.6	−0.3040	0.5815	0.1299	+27	−41
κ Geminorum	3.7	2.02	3.3	24 36.4	13 56.0	+ 1 40.4	+1.0921	0.5815	0.1303	+90	+36
ω Cancri	5.9	2.05	2.2	25 37.8	20 29.5	+ 7 58.5	−0.8688	0.5786	0.1485	− 6	−64
5 B. Cancri	6.4	2.01	2.2	23 49.2	20 33.2	+ 8 2.1	+0.9675	0.5786	0.1487	+90	+25
4 Cancri	6.2	+2.04	+2.2	+25 19.7	20 49.1	+ 8 17.3	−0.6092	0.5785	−0.1494	+10	−60
35 B. Cancri	6.4	2.00	1.5	23 23.9	12 1 39.9	−11 3.0	+0.6023	0.5761	0.1622	+86	+ 2
λ Cancri	5.9	2.02	+1.0	24 17.6	4 25.6	− 8 23.8	−0.7678	0.5746	0.1693	+ 1	−66
γ Cancri	4.7	1.94	−0.3	21 46.7	13 47.8	+ 0 37.2	+0.0943	0.5692	0.1919	+50	−27
12 B. Leonis	6.3	1.79	2.4	16 57.4	13 7 41.5	− 6 8.7	+1.1928	0.5579	0.2286	+90	+32
8 Leonis	5.9	+1.76	−3.0	+16 49.4	12 40.3	− 1 20.6	+0.1669	0.5547	−0.2372	+54	−29
α Leonis	1.3	1.59	4.1	12 23.2	14 2 33.9	−11 56.2	+1.1901	0.5463	0.2576	+90	+28
34 Leonis	6.4	1.60	4.5	13 46.7	4 0.6	−10 32.4	−0.5842	0.5455	0.2594	+14	−72
45 Leonis	5.8	1.50	4.6	10 12.0	11 17.1	− 3 30.8	+1.0981	0.5417	0.2675	+90	+19
ρ Leonis	3.8	1.47	4.8	9 44.9	13 38.8	− 1 14.0	+0.9178	0.5404	0.2699	+90	+ 7
49 Leonis	5.7	+1.45	−4.7	+ 9 5.6	14 40.3	− 0 14.6	+1.2987	0.5400	−0.2708	+90	+35
56 Leonis	6.1	1.34	5.1	6 38.6	15 0 22.7	+ 9 8.4	+1.0937	0.5358	0.2785	+90	+17
c Leonis	5.1	1.32	5.4	6 33.7	2 34.8	+11 16.1	+0.5602	0.5348	0.2799	+78	−15
χ Leonis	4.7	1.32	5.9	7 48.0	4 35.0	−10 47.6	−1.2455	0.5341	0.2810	−27	−82
80 Leonis	6.4	1.19	6.0	4 19.9	14 22.5	− 1 19.3	−0.5333	0.5312	0.2851	+17	−76
83 Leonis	6.3	+1.17	−5.7	+ 3 28.8	14 50.4	− 0 52.4	+0.1901	0.5311	−0.2853	+54	−34
τ Leonis	5.2	1.17	5.8	3 19.7	15 22.0	− 0 21.8	+0.1930	0.5310	0.2854	+55	−34
89 Leonis	5.7	1.14	6.1	3 32.2	18 25.1	+ 2 35.3	−0.8884	0.5303	0.2861	− 2	−86
9 B. Virginis	6.2	1.04	5.7	+ 0 9.5	16 1 22.9	+ 9 19.6	+0.5155	0.5292	0.2868	+75	−18
31 B. Virginis	6.4	0.97	5.8	− 1 17.3	7 5.2	− 9 9.0	+0.3365	0.5287	0.2865	+63	−26
162 B. Virginis	6.2	+0.82	−5.9	− 4 8.5	19 51.2	+ 3 12.2	−0.4270	0.5289	−0.2828	+22	−69
200 B. Virginis	6.3	0.80	5.9	4 34.8	21 38.9	+ 4 56.5	−0.4912	0.5291	0.2820	+19	−73
f Virginis	6.0	0.77	5.8	5 21.6	17 0 5.2	+ 7 17.9	−0.3900	0.5294	0.2807	+24	−66
319 B. Virginis	6.3	0.71	6.1	5 50.0	5 10.7	−11 46.4	−1.3344	0.5303	0.2776	−38	−90
ψ Virginis	5.0	0.64	5.2	9 4.4	8 22.4	− 8 41.0	+1.0582	0.5310	0.2753	+81	+13
49 Virginis	5.2	+0.57	−5.2	−10 16.9	14 43.3	− 2 32.6	+0.5503	0.5327	−0.2701	+73	−16
g Virginis	5.6	0.58	5.8	8 31.5	15 2.0	− 2 14.5	−1.3128	0.5328	0.2698	−37	−90
50 Virginis	6.2	0.56	5.4	9 52.3	15 35.6	− 1 42.0	−0.1000	0.5329	0.2693	+37	−50
α Virginis	1.2	0.48	5.6	10 42.9	22 46.2	+ 5 14.3	−1.1549	0.5354	0.2620	−23	−90
i Virginis	5.7	0.46	5.2	12 15.7	23 28.2	+ 5 55.0	+0.2314	0.5357	0.2613	+53	−32
550 B. Virginis	6.0	+0.42	−5.2	−12 46.5	18 3 7.8	+ 9 27.2	−0.1962	0.5371	−0.2570	+30	−55
85 Virginis	6.1	0.34	4.7	15 20.2	8 6.4	− 9 44.3	+1.1433	0.5393	0.2507	+75	+21
214 G. Virginis	6.5	0.24	5.1	15 55.6	16 59.1	− 1 9.6	−0.4277	0.5436	0.2380	+16	−70
40 H. Virginis	5.1	0.22	5.3	15 53.9	19 29.7	+ 1 15.8	−1.0497	0.5450	0.2341	−20	−90
43 H. Virginis	5.5	0.18	4.7	17 48.1	21 30.7	+ 3 12.5	+0.4224	0.5461	0.2308	+59	−22
231 G. Virginis	6.4	+0.17	−4.6	−18 11.2	22 14.7	+ 3 55.1	+0.6478	0.5465	−0.2295	+71	−10
236 G. Virginis	5.7	0.16	4.6	18 19.1	22 56.7	+ 4 35.6	+0.6220	0.5468	0.2284	+69	−11
9 G. Libræ	6.5	0.07	4.5	20 3.8	19 6 3.5	+11 27.5	+0.8248	0.5509	0.2157	+70	+ 1
17 G. Libræ	6.4	+0.01	4.6	20 48.8	10 58.8	− 7 47.7	+0.5536	0.5538	0.2063	+63	−15
18 G. Libræ	6.1	0.00	4.6	20 58.0	11 25.7	− 7 21.7	+0.6178	0.5540	0.2054	+66	−11
43 B. Libræ	5.7	−0.04	−5.0	−21 1.8	15 47.1	− 3 9.7	−0.1919	0.5566	−0.1965	+23	−55
47 G. Libræ	6.1	0.09	4.9	21 41.9	19 39.2	+ 0 33.9	−0.2499	0.5588	0.1882	+19	−59
64 G. Libræ	5.8	0.13	5.1	22 5.0	23 51.2	+ 4 36.7	−0.6270	0.5613	0.1788	− 1	−88
153 B. Libræ	6.3	0.22	4.9	24 12.0	20 6 50.3	+11 20.2	+0.3571	0.5653	0.1623	+47	−25
42 Libræ	5.0	0.24	5.3	23 32.4	9 48.2	− 9 48.5	−0.7917	0.5669	0.1550	−13	−90
b Scorpii	4.7	−0.30	−5.0	−25 29.5	14 10.7	− 5 35.9	+0.5662	0.5692	−0.1439	+58	−13

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y′	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
A Scorpii	4.6	−0.31	−5.2	−25 4.3	20 15 15.8	− 4 33.2	−0.0214	0.5697	−0.1411	+26	−45
31 B. Scorpii	5.4	0.30	5.4	24 16.8	15 23.5	− 4 25.9	−0.8583	0.5698	0.1407	−18	−90
3 Scorpii	5.9	0.32	5.3	24 59.5	15 41.5	− 4 8.5	−0.1658	0.5700	0.1399	+18	−54
4 Scorpii	5.7	0.32	5.0	26 0.9	16 1.4	− 3 49.4	+0.8447	0.5701	0.1391	+64	+ 4
40 B. Scorpii	5.4	0.32	5.5	24 35.1	17 18.0	− 2 35.7	−0.8064	0.5707	0.1357	−16	−90
π Scorpii	3.0	−0.34	−5.1	−25 52.1	17 23.5	− 2 30.3	+0.5066	0.5708	−0.1355	+54	−16
48 B. Scorpii	4.9	0.35	5.3	25 37.7	19 13.7	− 0 44.3	+0.0135	0.5717	0.1306	+26	−44
50 B. Scorpii	6.4	0.34	5.7	24 29.5	19 28.4	− 0 30.2	−1.1929	0.5718	0.1299	−45	−90
65 B. Scorpii	5.5	0.37	5.3	26 5.9	21 9.4	+ 1 6.9	+0.2531	0.5726	0.1254	+38	−30
85 B. Scorpii	6.0	0.39	5.8	25 15.7	23 54.6	+ 3 45.7	−0.9484	0.5738	0.1178	−26	−90
σ Scorpii	3.1	−0.41	−5.9	−25 23.3	21 2 26.9	+ 6 12.2	−1.1068	0.5748	−0.1108	−39	−90
α Scorpii	1.2	0.45	5.9	26 14.6	5 44.2	+ 9 21.9	−0.5711	0.5761	0.1015	− 6	−84
116 B. Scorpii	6.2	0.45	5.9	26 21.2	6 31.7	+10 7.6	−0.5374	0.5764	0.0993	− 5	−81
τ Scorpii	2.9	0.48	5.6	28 2.4	8 18.1	+11 49.9	+1.0416	0.5770	0.0942	+62	+20
134 B. Scorpii	6.4	0.50	6.0	27 17.8	11 40.2	− 8 55.9	−0.0300	0.5780	0.0844	+20	−46
135 B. Scorpii	6.0	−0.51	−5.7	−28 21.1	11 56.3	− 8 40.4	+1.0433	0.5781	−0.0836	+62	+20
95 G. Ophiuchi	6.1	0.58	6.6	27 39.5	22 50.0	+ 1 47.7	−0.4122	0.5803	0.0511	− 3	−71
43 Ophiuchi	5.4	0.62	6.8	28 3.7	22 3 9.4	+ 5 56.8	−0.1838	0.5807	0.0380	+ 8	−55
163 G. Ophiuchi	6.3	0.66	7.3	27 50.7	11 3.1	−10 28.2	−0.6169	0.5806	0.0140	−16	−90
X Sagittarii (*var.*)	4.4	0.67	7.4	27 48.1	12 44.6	− 8 50.6	−0.6831	0.5804	−0.0088	−20	−90
10 G. Sagittarii	5.7	−0.68	−7.6	−28 3.2	16 21.9	− 5 21.9	−0.4304	0.5800	+0.0023	− 8	−73
210 B. Scorpii	5.8	0.69	7.5	28 45.1	17 7.9	− 4 37.7	+0.3046	0.5799	0.0046	+31	−27
W Sagittarii (*var.*)	4.3	0.71	7.5	29 35.2	19 39.1	− 2 12.4	+1.2023	0.5793	0.0122	+60	+39
38 B. Sagittarii	4.7	0.71	7.8	28 28.2	20 53.4	− 1 1.0	+0.0467	0.5790	0.0159	+18	−42
C. D.−28° 14268	6.4	0.72	7.8	28 55.4	22 26.0	+ 0 28.0	+0.5514	0.5787	0.0206	+48	−13
48 G. Sagittarii	6.3	−0.72	−8.0	−28 19.1	23 0 36.6	+ 2 33.6	−0.0313	0.5780	+0.0271	+15	−46
62 B. Sagittarii	6.0	0.72	7.9	28 41.0	0 36.8	+ 2 33.8	+0.3524	0.5780	0.0271	+36	−24
58 G. Sagittarii	6.1	0.72	8.0	28 28.3	2 27.6	+ 4 20.3	+0.1850	0.5774	0.0326	+27	−34
φ Sagittarii	3.3	0.74	8.7	27 5.0	12 2.4	−10 27.1	−0.8336	0.5736	0.0606	−25	−90
				NEW	*MOON.*						
42 Aquarii	5.5	−0.52	−7.8	−13 15.8	27 13 45.0	+11 59.6	+0.7864	0.5019	+0.2426	+70	− 3
σ Aquarii	4.9	0.49	7.1	11 7.2	21 12.0	− 4 46.1	+0.2723	0.4975	0.2481	+56	−30
58 Aquarii	6.4	0.49	7.1	11 20.9	21 45.5	− 4 13.5	+0.6612	0.4972	0.2485	+78	−10
213 B. Aquarii	6.5	0.47	6.4	8 45.8	28 3 58.8	+ 1 49.4	−0.6148	0.4939	0.2523	+11	−83
λ Aquarii	3.8	−0.44	−5.9	− 8 2.3	9 15.3	+ 6 57.2	−0.0726	0.4914	+0.2550	+39	−48
78 Aquarii	6.3	0.44	5.8	7 39.8	10 20.5	+ 8 0.6	−0.2079	0.4909	0.2555	+32	−56
81 Aquarii	6.4	0.42	5.6	7 31.5	14 8.6	+11 42.5	+0.6138	0.4893	0.2570	+79	−13
82 Aquarii	6.4	0.42	5.4	7 2.3	14 47.3	−11 39.9	+0.2437	0.4891	0.2573	+56	−32
φ Aquarii	4.4	0.38	5.0	6 30.9	21 24.3	− 5 13.6	+1.3784	0.4866	0.2594	+83	+42
293 B. Aquarii	5.5	−0.40	−4.4	− 3 58.0	22 7.3	− 4 31.7	−1.2431	0.4864	+0.2596	−27	−90
96 Aquarii	5.7	0.37	4.6	5 35.7	29 0 16.1	− 2 26.4	+1.1108	0.4857	0.2601	+84	+16
316 B. Aquarii	6.5	0.38	4.3	4 23.3	0 45.5	− 1 57.8	−0.0925	0.4856	0.2602	+39	−49
14 Piscium	5.9	0.35	3.1	− 1 43.4	8 40.3	+ 5 44.4	−0.9695	0.4835	0.2615	− 7	−90
21 Piscium	5.6	0.31	2.0	+ 0 35.9	17 26.5	− 9 43.2	−1.2408	0.4819	0.2618	−26	−89
60 B. Piscium	6.0	−0.28	−2.0	− 0 22.2	20 29.8	− 6 44.8	+0.6289	0.4816	+0.2617	+84	−12
51 Piscium	5.6	0.18	+1.4	+ 6 28.9	30 18 5.2	− 9 43.4	−1.3468	0.4818	0.2569	−38	−84
60 Piscium	6.2	0.11	1.9	6 16.3	31 2 38.6	− 1 23.6	+1.0689	0.4833	0.2534	+90	+15
62 Piscium	6.1	0.10	2.1	6 49.9	3 8.7	− 0 54.3	+0.5765	0.4833	0.2532	+80	−14
δ Piscium	4.6	−0.11	2.2	7 7.1	3 22.1	− 0 41.2	+0.3153	0.4834	0.2531	+62	−27

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101 Piscium	6.2	+0.07	+6.3	+14 13.4	1 5 35.6	+ 0 49.5	−1.1274	0.4926	+0.2353	−19	−76
47 B. Arietis	6.5	0.24	8.4	17 37.3	22 40.9	− 6 34.2	−0.9964	0.5022	0.2180	−11	−72
20 H¹. Arietis	6.4	+0.26	+8.2	+16 49.4	23 31.9	− 5 44.7	+0.0687	0.5027	+0.2171	+48	−34

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
26 Arietis	6.2	+0.37	+ 9.6	+19 28.6	2 10 27.9	+ 4 52.0	−0.5499	0.5102	+0.2033	−15	−64
μ Arietis	5.7	0.45	10.0	19 38.9	16 22.2	+10 35.6	+0.4380	0.5145	0.1949	+72	−12
47 Arietis	5.8	0.55	10.4	20 19.6	3 0 6.7	− 5 54.4	+1.1554	0.5206	0.1829	+90	+33
ε Arietis (*mean*)	4.6	0.56	10.7	21 0.0	0 39.8	− 5 22.3	+0.5208	0.5210	0.1820	+78	− 6
64 Arietis	5.8	0.72	12.2	24 25.4	12 36.5	+ 6 11.5	−1.1581	0.5309	0.1610	−27	−66
66 Arietis	6.1	+0.75	+11.5	+22 30.7	14 34.3	+ 8 5.4	+1.2330	0.5325	+0.1573	+90	+44
7 Tauri	5.9	0.79	12.1	24 10.8	17 20.0	+10 45.5	−0.1526	0.5349	0.1520	+36	−36
11 Tauri	6.1	0.84	12.5	25 3.3	20 13.9	−10 26.3	−0.6694	0.5374	0.1462	+ 7	−64
16 Tauri	5.4	0.86	12.1	24 1.4	22 5.3	− 8 38.7	+0.7168	0.5389	0.1423	+90	+ 9
17 Tauri	3.8	0.86	12.0	23 50.8	22 7.4	− 8 36.7	+0.9125	0.5390	0.1423	+90	+21
18 Tauri	5.6	+0.86	+12.3	+24 34.4	22 14.5	− 8 29.7	+0.1426	0.5391	+0.1420	+53	−20
q Tauri	4.3	0.87	12.2	24 12.1	22 16.1	− 8 28.2	+0.5491	0.5391	0.1420	+82	0
20 Tauri	4.1	0.87	12.1	24 6.2	22 33.1	− 8 11.8	+0.6958	0.5393	0.1414	+90	+ 8
21 Tauri	5.8	0.87	12.2	24 17.4	22 35.2	− 8 9.8	+0.4982	0.5394	0.1413	+77	− 2
22 Tauri	6.5	0.87	12.2	24 15.8	22 39.0	− 8 6.1	+0.5358	0.5394	0.1411	+80	0
23 Tauri	4.3	+0.87	+12.0	+23 41.1	22 47.1	− 7 58.3	+1.1818	0.5395	+0.1409	+90	+41
η Tauri	3.0	0.88	12.0	23 50.6	23 18.5	− 7 28.0	+1.0831	0.5400	0.1398	+90	+33
27 Tauri	3.7	0.89	12.0	23 47.7	4 0 4.2	− 6 43.8	+1.2412	0.5406	0.1382	+90	+48
28 Tauri	5.2	0.89	12.0	23 52.7	0 4.8	− 6 43.2	+1.1522	0.5406	0.1381	+90	+39
14 H. Tauri	5.3	0.90	12.5	25 19.5	0 34.0	− 6 15.0	−0.3449	0.5411	0.1371	+25	−45
p Tauri	5.6	+1.05	+12.8	+26 15.7	9 41.9	+ 2 34.0	−0.1936	0.5488	+0.1168	+34	−35
φ Tauri	5.0	1.12	12.9	27 9.0	13 50.7	+ 6 34.0	−0.6839	0.5522	0.1070	+ 6	−62
χ Tauri	5.3	1.13	12.3	25 25.8	14 50.2	+ 7 31.3	+1.2662	0.5530	0.1046	+90	+55
5 B. Aurigæ	5.7	1.28	13.0	28 27.2	22 49.0	− 8 47.2	−1.2148	0.5593	0.0845	−39	−61
17 B. Aurigæ	6.0	1.36	12.6	27 45.5	5 3 39.1	− 4 7.7	−0.0934	0.5629	0.0718	+39	−25
38 B. Aurigæ	6.5	+1.44	+12.2	+27 34.8	8 35.1	+ 0 37.2	+0.4166	0.5663	+0.0584	+72	+ 2
47 B. Aurigæ	6.0	1.47	12.2	27 55.6	10 41.3	+ 2 38.7	+0.1656	0.5677	0.0526	+54	−10
354 B. Tauri	6.4	1.55	11.8	27 52.5	15 17.9	+ 7 4.8	+0.4321	0.5706	0.0395	+73	+ 4
73 B. Aurigæ	5.8	1.57	12.3	29 29.2	15 21.6	+ 7 8.3	−1.2712	0.5707	0.0393	−55	−61
22 Aurigæ	6.4	1.58	12.0	28 51.5	16 15.3	+ 8 0.0	−0.5727	0.5712	0.0368	+12	−50
β Tauri	1.8	+1.59	+11.8	+28 32.3	17 26.6	+ 9 8.6	−0.1926	0.5719	+0.0333	+33	−27
107 B. Aurigæ	6.5	1.64	11.2	27 36.6	21 21.6	−11 5.5	+0.8949	0.5740	0.0219	+90	+32
116 B. Aurigæ	5.9	1.68	11.5	29 10.2	22 41.6	− 9 48.6	−0.7214	0.5747	0.0180	+ 2	−60
406 B. Tauri	5.6	1.74	10.7	27 56.8	6 3 23.5	− 5 17.6	+0.6167	0.5770	0.0039	+90	+17
136 Tauri	4.6	1.75	10.5	27 35.7	4 20.4	− 4 23.0	+0.9862	0.5773	+0.0011	+90	+39
154 B. Aurigæ	6.4	+1.79	+10.8	+28 56.0	5 36.4	− 3 9.9	−0.4169	0.5779	−0.0028	+21	−38
415 B. Tauri	6.1	1.79	10.2	27 34.3	7 23.9	− 1 26.6	+0.9987	0.5786	0.0082	+90	+39
183 B. Aurigæ	6.3	1.86	10.5	29 31.4	9 29.7	+ 0 34.3	−1.0669	0.5794	0.0146	−23	−60
κ Aurigæ	4.4	1.90	10.0	29 32.0	13 3.8	+ 3 59.9	−1.1469	0.5804	0.0255	−31	−60
211 B. Aurigæ	6.3	1.94	9.8	29 35.0	15 21.4	+ 6 12.1	−1.2638	0.5811	0.0326	−52	−60
MARS	−0.5	. . .	. . .	+27 3.5	19 30.2	+10 11.0	+1.2047	0.5870	−0.0447	+90	+53
49 Aurigæ	5.1	+1.99	+ 8.6	28 5.6	20 53.8	+11 31.3	+0.0606	0.5822	0.0497	+48	−15
53 Aurigæ	5.6	2.02	8.7	29 3.7	22 8.0	−11 17.5	−1.0078	0.5824	0.0535	−18	−61
54 Aurigæ	5.8	2.02	8.5	28 20.5	22 36.2	−10 50.4	−0.2875	0.5825	0.0550	+28	−34
28 Geminorum	5.5	2.06	8.4	29 3.7	7 0 38.2	− 8 53.2	−1.1495	0.5828	0.0612	−31	−61
47 Geminorum	5.6	+2.14	+ 6.3	+27 0.0	11 7.6	+ 1 11.2	+0.1689	0.5829	−0.0934	+54	−13
53 Geminorum	5.9	2.18	6.2	28 3.0	12 54.4	+ 2 53.8	−1.0801	0.5828	0.0987	−23	−62
134 B. Geminorum	6.5	2.16	5.9	26 50.8	13 21.4	+ 3 19.7	+0.1108	0.5827	0.1001	+51	−17
59 Geminorum	5.7	2.21	5.6	27 48.4	16 17.8	+ 6 9.2	−1.1801	0.5823	0.1088	−33	−62
υ Geminorum	4.3	2.23	4.7	27 5.3	20 47.6	+10 28.2	−0.9621	0.5815	0.1221	−13	−63
c Geminorum	5.5	+2.24	+ 4.1	+25 59.4	8 0 3.1	−10 24.0	−0.2521	0.5808	−0.1316	+30	−39
κ Geminorum	3.7	2.21	3.8	24 36.4	0 12.3	−10 15.2	+1.1406	0.5808	0.1320	+90	+39
ω Cancri	5.9	2.28	2.8	25 37.8	6 44.7	− 3 58.2	−0.8266	0.5789	0.1504	− 3	−64
5 B. Cancri	6.4	2.24	2.5	23 49.3	6 48.3	− 3 54.7	+1.0031	0.5788	0.1506	+90	+27
4 Cancri	6.2	2.28	2.7	25 19.7	7 4.2	− 3 39.4	−0.5685	0.5788	0.1513	+13	−58
35 B. Cancri	6.4	+2.26	+ 1.6	+23 23.9	11 53.4	+ 0 58.6	+0.6294	0.5770	−0.1643	+89	+ 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d	h m	h m				°	°
λ Cancri	5.9	+2.30	+ 1.3	+24 17.7	8	14 38.0	+ 3 36.7	−0.7393	0.5759	−0.1715	+ 3	−65
γ Cancri	4.7	2.28	− 0.6	21 46.7		23 55.0	−11 27.7	+0.1010	0.5718	0.1947	+50	−27
12 B. Leonis	6.3	2.22	3.8	16 57.4	9	17 33.0	+ 5 30.9	+1.1553	0.5627	0.2325	+90	+29
8 Leonis	5.9	2.21	4.6	16 49.3		22 26.0	+10 13.2	+0.1300	0.5602	0.2415	+52	−30
α Leonis	1.3	2.11	6.5	12 23.2	10	12 1.0	− 0 41.1	+1.1149	0.5533	0.2626	+90	+21
34 Leonis	6.4	+2.14	− 6.8	+13 46.7		13 25.5	+ 0 40.3	−0.6398	0.5526	−0.2645	+11	−75
45 Leonis	5.8	2.06	7.6	10 11.9		20 30.7	+ 7 30.7	+1.0076	0.5493	0.2731	+90	+12
ρ Leonis	3.8	2.04	7.9	9 44.8		22 48.4	+ 9 43.5	+0.8255	0.5483	0.2755	+90	+ 1
49 Leonis	5.7	2.03	7.9	9 5.6		23 48.3	+10 41.3	+1.1993	0.5479	0.2765	+90	+20
56 Leonis	6.1	1.96	8.9	6 38.5	11	9 13.7	− 4 12.7	+0.9803	0.5443	0.2846	+90	+ 0
c Leonis	5.1	+1.95	− 9.1	+ 6 33.7		11 21.8	− 2 8.9	+0.4512	0.5436	−0.2860	+71	−20
χ Leonis	4.7	1.95	9.5	7 47.9		13 18.3	− 0 16.4	−1.3306	0.5430	0.2872	−36	−82
80 Leonis	6.4	1.86	10.1	4 19.9		22 47.1	+ 8 53.1	−0.6431	0.5404	0.2915	+12	−84
83 Leonis	6.3	1.84	10.0	3 28.8		23 14.2	+ 9 19.3	+0.0685	0.5404	0.2916	+48	−40
τ Leonis	5.2	1.84	10.0	3 19.6		23 44.7	+ 9 48.8	+0.0705	0.5403	0.2918	+48	−40
89 Leonis	5.7	+1.82	−10.4	+ 3 32.1	12	2 41.8	−11 20.2	−0.9980	0.5397	−0.2925	− 9	−86
9 B. Virginis	6.2	1.74	10.4	+ 0 9.4		9 25.8	− 4 49.8	+0.3750	0.5387	0.2932	+66	−25
31 B. Virginis	6.4	1.70	10.7	− 1 17.4		14 56.8	+ 0 30.2	+0.1923	0.5382	0.2928	+55	−34
162 B. Virginis	6.2	1.58	11.5	4 8.6	13	3 17.4	−11 34.1	−0.5714	0.5383	0.2887	+15	−79
200 B. Virginis	6.3	1.57	11.1	4 34.9		5 1.6	− 9 53.3	−0.6363	0.5384	0.2878	+11	−65
f Virginis	6.0	+1.54	−11.1	− 5 21.7		7 23.1	− 7 36.6	−0.5387	0.5386	−0.2864	+16	−77
χ Virginis	4.8	1.51	10.6	7 31.5		8 30.4	− 6 31.5	+1.2922	0.5387	0.2857	+82	−32
ψ Virginis	5.0	1.45	10.6	9 4.5		15 24.4	+ 0 8.5	+0.8822	0.5398	0.2806	+81	+ 2
49 Virginis	5.2	1.40	10.6	10 17.0		21 33.6	+ 6 5.2	+0.3786	0.5412	0.2750	+63	−25
50 Virginis	6.2	1.39	10.8	9 52.4		22 24.4	+ 6 54.3	−0.2628	0.5413	0.2741	+29	−59
α Virginis	1.2	+1.33	−11.0	−10 42.9	14	5 22.4	−10 21.9	−1.3064	0.5433	−0.2663	−37	−90
i Virginis	5.7	1.31	10.6	12 15.8		6 3.2	− 9 42.5	+0.0611	0.5435	0.2655	+44	−41
550 B. Virginis	6.0	1.28	10.6	12 46.6		9 36.7	− 6 16.3	−0.3620	0.5447	0.2610	+22	−65
85 Virginis	6.1	1.22	10.0	15 20.3		14 27.4	− 1 35.7	+0.9601	0.5464	0.2543	+75	+ 8
214 G. Virginis	6.5	1.14	10.2	15 55.6		23 7.0	+ 6 45.6	−0.5927	0.5500	0.2409	+ 8	−85
40 H. Virginis	5.1	+1.12	−10.3	−15 53.9	15	1 34.3	+ 9 7.8	−1.2081	0.5511	−0.2367	−32	−90
43 H. Virginis	5.5	1.09	9.8	17 48.2		3 32.6	+11 1.9	+0.2486	0.5518	0.2332	+49	−31
231 G. Virginis	6.4	1.08	9.6	18 11.3		4 15.6	+11 43.4	+0.4718	0.5521	0.2320	+62	−20
236 G. Virginis	5.7	1.08	9.6	18 19.2		4 56.7	−11 37.0	+0.4465	0.5525	0.2307	+60	−21
9 G. Libræ	6.5	1.00	9.3	20 3.9		11 55.1	− 4 53.5	+0.6494	0.5557	0.2175	+69	−10
17 G. Libræ	6.4	+0.95	− 9.2	−20 48.9		16 45.2	− 0 13.9	+0.3824	0.5579	−0.2076	+54	−24
18 G. Libræ	6.1	0.95	9.2	20 58.0		17 11.6	+ 0 11.4	+0.4462	0.5581	0.2067	+57	−20
43 B. Libræ	5.7	0.92	9.4	21 1.9		21 29.0	+ 4 19.4	−0.3556	0.5601	0.1975	+15	−90
47 G. Libræ	6.1	0.87	9.1	21 42.0	16	1 17.7	+ 7 59.8	−0.4118	0.5619	0.1889	+11	−73
64 G. Libræ	5.8	0.83	9.1	22 5.1		5 26.6	+11 59.5	−0.7850	0.5638	0.1793	−10	−90
153 B. Libræ	6.3	+0.75	− 8.5	−24 12.0		12 21.4	− 5 21.3	+0.1970	0.5669	−0.1623	+39	−34
42 Libræ	5.0	0.72	8.8	23 32.5		15 17.8	− 2 31.5	−0.9448	0.5681	0.1549	−22	−90
b Scorpii	4.7	0.67	8.1	25 29.6		19 38.5	+ 1 39.3	+0.4101	0.5698	0.1435	+49	−22
A Scorpii	4.6	0.66	8.3	25 4.4		20 43.3	+ 2 41.6	−0.1747	0.5702	0.1407	+18	−55
31 B. Scorpii	5.4	0.66	8.6	24 16.8		20 50.9	+ 2 48.9	−1.0085	0.5703	0.1403	−28	−90
3 Scorpii	5.9	+0.66	− 8.3	−24 59.5		21 8.8	+ 3 6.2	−0.3183	0.5704	−0.1395	+11	−64
4 Scorpii	5.7	0.65	8.0	26 0.9		21 28.6	+ 3 25.2	+0.6890	0.5706	0.1387	+63	− 6
40 B. Scorpii	5.4	0.64	8.5	24 35.2		22 44.8	+ 4 38.5	−0.9560	0.5710	0.1352	−25	−90
π Scorpii	3.0	0.64	8.1	25 52.2		22 50.4	+ 4 43.9	+0.3530	0.5710	0.1350	+45	−25
48 B. Scorpii	4.9	0.62	8.2	25 37.7	17	0 40.0	+ 6 29.2	−0.1374	0.5717	0.1300	+19	−32
65 B. Scorpii	5.5	+0.60	− 8.0	−26 5.9		2 35.3	+ 8 20.1	+0.1028	0.5723	−0.1247	+30	−39
85 B. Scorpii	6.0	0.58	8.4	25 15.7		5 20.1	+10 58.6	−1.0942	0.5732	0.1171	−37	−90
σ Scorpii	3.1	0.55	8.4	25 23.4		7 52.1	−10 35.3	−1.2509	0.5739	0.1100	−53	−90
α Scorpii	1.2	0.51	8.1	26 14.7		11 9.3	− 7 25.7	−0.7140	0.5747	0.1006	−14	−90
116 B. Scorpii	6.2	0.51	8.1	26 21.2		11 56.7	− 6 40.1	−0.6799	0.5750	0.0983	−12	−90
τ Scorpii	2.9	+0.49	− 7.6	−28 2.4		13 43.2	− 4 57.7	+0.8992	0.5753	−0.0932	+62	+ 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
134 B. Scorpii	6.4	+0.45	− 7.8	−27 17.9	**17** 17 5.7	− 1 43.2	−0.1691	0.5759	−0.0833	+13	−55
135 B. Scorpii	6.0	0.45	7.4	28 21.1	17 21.8	− 1 27.6	+0.9042	0.5760	0.0825	+62	+ 9
95 G. Ophiuchi	6.1	0.34	7.8	27 39.5	**18** 4 18.2	+ 9 3.2	−0.5429	0.5770	0.0500	− 9	−83
43 Ophiuchi	5.4	0.30	7.7	28 3.8	8 39.2	−10 46.1	−0.3108	0.5770	0.0369	+ 1	−64
163 G. Ophiuchi	6.3	0.23	7.8	27 50.7	16 36.9	− 3 7.0	−0.7383	0.5762	0.0129	−24	−90
X Sagittarii (*var.*)	4.4	+0.21	− 7.8	−27 48.1	18 19.3	− 1 28.6	−0.8033	0.5760	−0.0078	−28	−90
10 G. Sagittarii	5.7	0.18	7.7	28 3.2	21 58.8	+ 2 2.4	−0.5467	0.5752	+0.0032	−14	−83
210 B. Scorpii	5.8	0.17	7.5	28 45.1	22 45.3	+ 2 47.1	+0.1914	0.5750	0.0055	+24	−33
W Sagittarii (*var.*)	4.3	0.15	7.2	29 35.2	**19** 1 18.1	+ 5 14.0	+1.0948	0.5744	0.0131	+60	+26
38 B. Sagittarii	4.7	0.14	7.6	28 28.2	2 33.4	+ 6 26.4	−0.0639	0.5740	0.0168	+12	−48
C. D.−28° 14268	6.4	+0.13	− 7.4	−28 55.4	4 7.0	+ 7 56.4	+0.4442	0.5736	+0.0214	+41	−19
48 G. Sagittarii	6.3	0.11	7.6	28 19.1	6 19.2	+10 3.5	−0.1387	0.5728	0.0279	+ 9	−53
62 B. Sagittarii	6.0	0.11	7.5	28 41.0	6 19.4	+10 3.6	+0.2466	0.5728	0.0279	+29	−30
58 G. Sagittarii	6.1	0.09	7.6	28 28.3	8 11.6	+11 51.5	+0.0802	0.5721	0.0333	+21	−40
φ Sagittarii	3.3	+0.02	7.9	27 4.9	17 54.1	− 2 48.1	−0.9340	0.5680	0.0611	−31	−90
τ Sagittarii	3.5	−0.04	− 7.7	−27 48.0	**20** 2 45.6	+ 5 43.6	+0.4767	0.5632	+0.0853	+48	−17
201 B. Sagittarii	5.9	0.06	8.0	26 3.2	5 26.3	+ 8 18.4	−1.1452	0.5616	0.0924	−43	−90
248 B. Sagittarii	5.7	0.10	7.7	27 9.9	12 31.0	− 8 52.4	+0.7579	0.5571	0.1105	+62	− 1
h Sagittarii	4.7	0.12	8.1	25 4.6	15 30.0	− 5 59.9	−1.1347	0.5551	0.1178	−40	−90
308 B. Sagittarii	6.3	0.16	8.2	24 9.5	23 13.6	+ 1 27.4	−1.1412	0.5496	0.1361	−38	−90
36 B. Capricorni	6.2	−0.23	− 8.0	−22 40.8	**21** 15 11.0	− 7 7.9	−0.2909	0.5376	+0.1697	+16	−62
17 Capricorni	5.8	0.26	8.0	21 49.8	22 59.6	+ 0 25.3	+0.1723	0.5316	0.1841	+41	−35
20 Capricorni	6.2	0.29	8.1	−19 22.3	**22** 5 27.4	+ 6 40.6	−1.2661	0.5267	0.1951	−43	−90
				NEW	*MOON.*						
51 Piscium	5.6	−0.36	− 0.1	+ 6 28.8	**27** 1 19.0	− 0 42.1	−1.2698	0.4832	+0.2583	−29	−84
60 Piscium	6.2	0.31	+ 0.5	6 16.3	9 52.0	+ 7 37.4	+1.1555	0.4845	0.2546	+90	+21
62 Piscium	6.1	0.32	0.6	6 49.8	10 22.1	+ 8 6.7	+0.6624	0.4846	0.2543	+88	−10
δ Piscium	4.6	0.32	0.7	7 7.0	10 35.5	+ 8 19.7	+0.4006	0.4847	0.2542	+67	−23
101 Piscium	6.2	−0.22	+ 4.3	+14 13.4	**28** 12 50.4	+ 9 52.0	−1.0385	0.4929	+0.2357	−13	−76

MARCH.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
47 B. Arietis	6.5	−0.11	+ 6.5	+17 37.3	**1** 6 0.0	+ 2 32.6	−0.9064	0.5015	+0.2179	− 5	−72
20 H¹. Arietis	6.4	0.09	6.3	16 49.4	6 51.3	+ 3 22.3	+0.1642	0.5020	0.2168	+54	−29
26 Arietis	6.2	−0.01	+ 7.9	+19 28.6	17 52.2	− 9 56.1	−0.4584	0.5085	+0.2027	+20	−60
μ Arietis	5.7	+0.06	8.3	19 38.9	23 50.0	− 4 9.0	+0.5352	0.5124	0.1941	+79	− 7
47 Arietis	5.8	0.15	8.9	20 19.6	**2** 7 39.6	+ 3 26.3	+1.2571	0.5178	0.1819	+90	+43
ε Arietis (*mean*)	4.6	0.15	9.2	21 0.0	8 13.1	+ 3 58.7	+0.6178	0.5181	0.1810	+87	0
64 Arietis	5.8	0.28	10.8	24 25.4	20 20.0	− 8 17.3	−1.0775	0.5268	0.1597	−20	−66
7 Tauri	5.9	+0.35	+10.9	+24 10.8	**3** 1 8.0	− 3 38.7	−0.0647	0.5304	+0.1506	+41	−33
11 Tauri	6.1	0.39	11.3	25 3.3	4 4.9	− 0 47.5	−0.5872	0.5326	0.1447	+12	−60
16 Tauri	5.4	0.42	11.0	24 1.4	5 58.3	+ 1 2.1	+0.8116	0.5340	0.1409	+90	+15
17 Tauri	3.8	0.42	11.0	23 50.8	6 0.4	+ 1 4.1	+1.0090	0.5340	0.1408	+90	+27
18 Tauri	5.6	0.42	11.2	24 34.4	6 7.7	+ 1 11.2	+0.2319	0.5341	0.1405	+58	−16
q Tauri	4.3	+0.43	+11.1	+24 12.1	6 9.4	+ 1 12.8	+0.6422	0.5342	+0.1405	+90	+ 5
20 Tauri	4.1	0.43	11.0	24 6.2	6 26.7	+ 1 29.6	+0.7903	0.5344	0.1399	+90	+13
21 Tauri	5.8	0.43	11.1	24 17.4	6 28.7	+ 1 31.5	+0.5907	0.5344	0.1398	+86	+ 2
22 Tauri	6.5	0.43	11.1	24 15.8	6 32.7	+ 1 35.4	+0.6287	0.5344	0.1396	+90	+ 5
23 Tauri	4.3	0.44	10.9	23 41.1	6 40.9	+ 1 43.3	+1.2808	0.5346	0.1394	+90	+53
η Tauri	3.0	+0.44	+11.0	+23 50.6	7 12.9	+ 2 14.2	+1.1810	0.5349	+0.1383	+90	+42
28 Tauri	5.2	0.45	11.0	23 52.7	8 0.0	+ 2 59.7	+1.2505	0.5355	0.1367	+90	+49
14 H. Tauri	5.3	0.46	11.5	25 19.4	8 29.8	+ 3 28.5	−0.2610	0.5359	0.1356	+30	−40
p Tauri	5.6	0.60	12.1	26 15.6	17 48.6	−11 31.6	−0.1116	0.5427	0.1152	+38	−30
φ Tauri	5.0	0.67	12.3	27 9.0	22 2.7	− 7 26.3	−0.6086	0.5458	0.1055	+10	−57
5 B. Aurigæ	5.7	+0.82	+12.7	+28 27.2	**4** 7 13.3	+ 1 25.0	−1.1494	0.5521	+0.0832	−30	−62

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
17 B. Aurigæ	6.0	+0.91	+12.4	+27 45.5	4 12 10.4	+6 11.5	−0.0174	0.5553	+0.0706	+43	−21
38 B. Aurigæ	6.5	1.00	12.2	27 34.8	17 13.8	+11 3.8	+0.4966	0.5584	0.0573	+78	+6
47 B. Aurigæ	6.0	1.04	12.3	27 55.6	19 23.3	−10 51.4	+0.2417	0.5597	0.0515	+59	−7
354 B. Tauri	6.4	1.12	12.0	27 52.5	5 0 7.1	−6 18.1	+0.5094	0.5623	0.0386	+79	+9
73 B. Aurigæ	5.8	1.13	12.6	29 29.2	0 10.9	−6 14.5	−1.2142	0.5623	0.0384	−40	−61
22 Aurigæ	6.4	+1.15	+12.3	+28 51.5	1 6.0	−5 21.4	−0.5078	0.5628	+0.0359	+16	−46
β Tauri	1.8	1.17	12.1	28 32.3	2 19.2	−4 10.9	−0.1237	0.5634	0.0325	+37	−23
107 B. Aurigæ	6.5	1.23	11.6	27 36.6	6 20.5	−0 18.6	+0.9751	0.5654	0.0212	+90	+37
116 B. Aurigæ	5.9	1.27	12.0	29 10.2	7 42.7	+1 0.5	−0.6613	0.5660	0.0173	+6	−55
406 B. Tauri	5.6	1.34	11.3	27 56.8	12 32.1	+5 39.0	+0.6907	0.5680	0.0035	+90	+21
136 Tauri	4.6	+1.36	+11.1	+27 35.8	13 30.6	+6 35.3	+1.0642	0.5684	+0.0006	+90	+44
154 B. Aurigæ	6.4	1.40	11.5	28 56.0	14 48.7	+7 50.4	−0.3564	0.5689	−0.0031	+24	−34
415 B. Tauri	6.1	1.41	10.8	27 34.3	16 39.2	+9 36.7	+1.0754	0.5696	0.0085	+90	+45
183 B. Aurigæ	6.3	1.47	11.3	29 31.4	18 48.4	+11 41.0	−1.0161	0.5703	0.0148	−19	−60
κ Aurigæ	4.4	1.54	11.0	29 32.0	22 28.4	−8 47.4	−1.0985	0.5714	0.0256	−26	−60
211 B. Aurigæ	6.3	+1.58	+10.8	+29 35.0	6 0 49.8	−6 31.5	−1.2180	0.5720	−0.0325	−41	−60
49 Aurigæ	5.1	1.66	9.7	28 5.6	6 31.3	−1 3.1	+0.1194	0.5731	0.0494	+52	−12
53 Aurigæ	5.6	1.69	9.9	29 3.7	7 47.4	+0 10.0	−0.9621	0.5733	0.0532	−14	−61
54 Aurigæ	5.8	1.69	9.6	28 20.6	8 16.4	+0 37.9	−0.2337	0.5734	0.0546	+31	−31
28 Geminorum	5.5	1.74	9.6	29 3.7	10 21.8	+2 38.5	−1.1065	0.5736	0.0608	−26	−61
47 Geminorum	5.6	+1.87	+7.6	+27 0.0	21 7.7	−11 0.6	+0.2214	0.5741	−0.0925	+58	−11
53 Geminorum	5.9	1.92	7.7	28 3.0	22 57.2	−9 15.3	−1.0416	0.5741	0.0978	−19	−62
134 B. Geminorum	6.5	1.90	7.2	26 50.8	23 24.9	−8 48.8	+0.1616	0.5741	0.0991	+54	−14
59 Geminorum	5.7	1.97	7.1	27 48.4	7 2 25.6	−5 54.9	−1.1441	0.5739	0.1078	−29	−62
υ Geminorum	4.3	2.02	6.2	27 5.4	7 2.0	−1 29.3	−0.9258	0.5734	0.1209	−10	−63
c Geminorum	5.5	+2.04	+5.4	+25 59.5	10 22.0	+1 43.1	−0.2106	0.5729	−0.1303	+33	−37
κ Geminorum	3.7	2.02	4.9	24 36.4	10 31.4	+1 52.1	+1.1948	0.5729	0.1307	+90	+44
ω Cancri	5.9	2.12	4.2	25 37.8	17 12.5	+8 17.8	−0.7935	0.5715	0.1491	0	−64
5 B. Cancri	6.4	2.08	3.7	23 49.3	17 16.2	+8 21.4	+1.0518	0.5714	0.1492	+90	+30
4 Cancri	6.2	2.12	4.1	25 19.7	17 32.4	+8 37.0	−0.5332	0.5714	0.1500	+15	−56
35 B. Cancri	6.4	+2.14	+2.8	+23 23.9	22 27.5	−10 39.1	+0.6715	0.5702	−0.1629	+90	+5
λ Cancri	5.9	2.18	2.6	24 17.7	8 1 15.2	−7 57.9	−0.7088	0.5693	0.1701	+5	−66
γ Cancri	4.7	2.24	+0.4	21 46.7	10 41.7	+1 7.4	+0.1322	0.5663	0.1934	+52	−25
12 B. Leonis	6.3	2.26	−3.5	16 57.4	9 4 31.9	−5 42.0	+1.1788	0.5597	0.2318	+90	+31
8 Leonis	5.9	2.29	4.4	16 49.3	9 26.9	−0 57.6	+0.1482	0.5578	0.2411	+53	−30
α Leonis	1.3	+2.26	−7.1	+12 23.2	23 3.7	−11 50.1	+1.1235	0.5530	−0.2631	+90	+22
34 Leonis	6.4	2.30	7.2	13 46.7	10 0 28.1	−10 28.8	−0.6290	0.5526	0.2650	+12	−74
45 Leonis	5.8	2.25	8.6	10 11.9	7 31.7	−3 40.1	+1.0100	0.5504	0.2741	+90	+12
ρ Leonis	3.8	2.25	8.9	9 44.8	9 48.6	−1 28.0	+0.8270	0.5497	0.2767	+90	+1
49 Leonis	5.7	2.24	9.1	9 5.6	10 48.0	−0 30.7	+1.1985	0.5495	0.2778	+90	+26
56 Leonis	6.1	+2.22	−10.5	+6 38.5	20 8.2	+8 30.0	+0.9737	0.5473	−0.2866	+90	+9
c Leonis	5.1	2.22	10.8	6 33.6	22 14.7	+10 32.2	+0.4467	0.5469	0.2883	+70	−20
χ Leonis	4.7	2.24	11.0	7 47.9	11 0 9.7	−11 36.8	−1.3237	0.5466	0.2896	−35	−82
80 Leonis	6.4	2.20	12.2	4 19.8	9 29.5	−2 36.2	−0.6440	0.5455	0.2946	+12	−84
83 Leonis	6.3	2.18	12.2	3 28.7	9 56.0	−2 10.7	+0.0611	0.5454	0.2948	+48	−41
τ Leonis	5.2	+2.19	−12.3	+3 19.6	10 26.0	−1 41.8	+0.0629	0.5454	−0.2950	+48	−41
89 Leonis	5.7	2.19	12.7	3 32.1	13 19.7	+1 6.0	−0.9964	0.5452	0.2959	−8	−86
9 B. Virginis	6.2	2.14	13.2	+0 9.3	19 55.1	+7 27.8	+0.3601	0.5451	0.2971	+65	−26
31 B. Virginis	6.4	2.12	13.7	−1 17.5	12 1 18.2	−11 20.3	+0.1773	0.5453	0.2970	+54	−35
162 B. Virginis	6.2	2.07	14.5	4 8.6	13 18.8	+0 15.5	−0.5801	0.5468	0.2935	+14	−80
200 B. Virginis	6.3	+2.07	−14.6	−4 34.9	14 59.8	+1 53.0	−0.6442	0.5471	−0.2927	+12	−86
f Virginis	6.0	2.06	14.7	5 21.7	17 17.1	+4 5.5	−0.5484	0.5476	0.2914	+16	−78
χ Virginis	4.8	2.04	14.5	7 31.6	18 22.4	+5 8.6	+1.2557	0.5478	0.2907	+82	+28
ψ Virginis	5.0	2.01	14.7	9 4.6	13 1 3.2	+11 35.4	+0.8496	0.5495	0.2858	+81	0
49 Virginis	5.2	1.98	14.8	10 17.1	7 0.2	−6 40.2	+0.3524	0.5512	0.2803	+60	−26
50 Virginis	6.2	+1.98	−14.9	−9 52.5	7 49.2	−5 52.9	−0.2789	0.5515	−0.2794	+28	−60

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
α Virginis	1.2	+1.95	−15.1	−10 43.0	13 14 32.6	+ 0 36.2	−1.3061	0.5539	−0.2716	−37	−90
ι Virginis	5.7	1.94	14.9	12 15.9	15 12.1	+ 1 14.3	+0.0387	0.5541	0.2708	+43	−42
150 B. Virginis	6.0	1.92	14.9	12 46.7	18 37.9	+ 4 32.8	−0.3776	0.5554	0.2662	+21	−66
85 Virginis	6.1	1.89	14.5	15 20.4	23 18.1	+ 9 2.8	+0.9217	0.5574	0.2595	+75	+ 5
114 G. Virginis	6.5	1.85	14.5	15 55.7	14 7 38.7	− 6 54.7	−0.6049	0.5610	0.2457	+ 7	−84
40 H. Virginis	5.1	+1.84	−14.6	−15 54.0	10 0.6	− 4 38.1	−1.2098	0.5620	−0.2415	−32	−90
43 H. Virginis	5.5	1.83	14.1	17 48.2	11 54.6	− 2 48.2	+0.2218	0.5629	0.2379	+48	−33
131 G. Virginis	6.4	1.83	14.0	18 11.4	12 36.0	− 2 8.3	+0.4411	0.5632	0.2366	+60	−21
136 G. Virginis	5.7	1.82	14.0	18 19.3	13 15.6	− 1 30.2	+0.4162	0.5636	0.2354	+58	−22
9 G. Libræ	6.5	1.78	13.6	20 4.0	19 58.6	+ 4 57.8	+0.6158	0.5666	0.2218	+67	−12
17 G. Libræ	6.4	+1.76	−13.4	−20 48.9	15 0 38.2	+ 9 26.8	+0.3536	0.5688	−0.2117	+52	−25
18 G. Libræ	6.1	1.75	13.3	20 58.1	1 3.7	+ 9 51.3	+0.4164	0.5690	0.2107	+55	−22
43 B. Libræ	5.7	1.73	13.6	21 1.9	5 11.9	−10 9.9	−0.3714	0.5708	0.2012	+15	−67
47 G. Libræ	6.1	1.70	13.0	21 42.1	8 52.6	− 6 37.6	−0.4265	0.5724	0.1924	+10	−71
64 G. Libræ	5.8	1.67	12.8	22 5.1	12 52.9	− 2 46.6	−0.7933	0.5741	0.1824	−11	−90
153 B. Libræ	6.3	+1.63	−12.0	−24 12.1	19 33.8	+ 3 38.7	+0.1734	0.5767	−0.1650	+38	−35
42 Libræ	5.0	1.61	12.1	23 32.6	22 24.4	+ 6 22.7	−0.9504	0.5777	0.1574	−23	−90
b Scorpii	4.7	1.58	11.4	25 29.6	16 2 37.0	+10 25.4	+0.3841	0.5791	0.1457	+48	−23
A Scorpii	4.6	1.57	11.4	25 4.4	3 39.7	+11 25.6	−0.1917	0.5794	0.1428	+17	−56
31 B. Scorpii	5.4	1.57	11.7	24 16.9	3 47.1	+11 32.7	−1.0129	0.5794	0.1424	−28	−90
3 Scorpii	5.9	+1.57	−11.5	−24 59.6	4 4.5	+11 49.5	−0.3331	0.5795	−0.1416	+10	−65
4 Scorpii	5.7	1.57	11.1	26 1.0	4 23.7	−11 52.1	+0.6591	0.5796	0.1407	+62	− 8
40 B. Scorpii	5.4	1.55	11.5	24 35.2	5 37.5	−10 41.2	−0.9611	0.5799	0.1372	−26	−90
π Scorpii	3.0	1.56	11.1	25 52.2	5 42.9	−10 36.1	+0.3284	0.5800	0.1369	+43	−26
48 B. Scorpii	4.9	1.54	11.1	25 37.8	7 29.3	− 8 53.9	−0.1544	0.5804	0.1319	+18	−54
65 B. Scorpii	5.5	+1.53	−10.8	−26 6.0	9 21.2	− 7 6.4	+0.0825	0.5809	−0.1264	+29	−40
85 B. Scorpii	6.0	1.50	11.0	25 15.7	12 1.2	− 4 32.7	−1.0972	0.5815	0.1186	−37	−90
σ Scorpii	3.1	1.48	10.9	25 23.4	14 29.0	− 2 10.8	−1.2517	0.5820	0.1113	−53	−90
α Scorpii	1.2	1.46	10.5	26 14.7	17 40.9	+ 0 53.4	−0.7221	0.5824	0.1018	−14	−90
116 B. Scorpii	6.2	1.45	10.4	26 21.2	18 27.0	+ 1 37.7	−0.6882	0.5825	0.0994	−13	−90
τ Scorpii	2.9	+1.44	− 9 8	−28 2.5	20 10.8	+ 3 17.4	+0.8702	0.5827	−0.0942	+62	+ 7
34 B. Scorpii	6.4	1.41	9.8	27 17.9	23 28.1	+ 6 26.8	−0.1836	0.5829	0.0842	+12	−56
35 B. Scorpii	6.0	1.41	9.5	28 21.2	23 43.8	+ 6 41.9	+0.8762	0.5830	0.0834	+62	+ 7
95 G. Ophiuchi	6.1	1.30	9.1	27 39.5	17 10 25.4	− 7 2.3	−0.5518	0.5826	0.0503	−10	−83
43 Ophiuchi	5.4	1.26	8.7	28 3.8	14 41.3	− 2 56.6	−0.3217	0.5820	0.0370	+ 1	−65
63 G. Ophiuchi	6.3	+1.18	− 8.3	−27 50.7	22 30.5	+ 4 34.0	−0.7443	0.5802	−0.0128	−24	−90
X Sagittarii (*var.*)	4.4	1.16	8.2	27 48.1	18 0 11.3	+ 6 10.8	−0.8086	0.5797	−0.0076	−28	−90
10 G. Sagittarii	5.7	1.13	7.9	28 3.3	3 47.5	+ 9 38.5	−0.5541	0.5785	+0.0034	−14	−84
110 B. Scorpii	5.8	1.12	7.6	28 45.1	4 33.4	+10 22.6	+0.1780	0.5782	0.0057	+24	−34
W Sagittarii (*var.*)	4.3	1.10	7.2	29 35.2	7 4.2	−11 12.4	+1.0748	0.5772	0.0134	+60	+24
38 B. Sagittarii	4.7	+1.08	− 7.5	−28 28.2	8 18.4	−10 1.2	−0.0747	0.5767	+0.0171	+11	−49
C. D.−28° 14268	6.4	1.07	7.2	28 55.4	9 51.0	− 8 32.2	+0.4299	0.5760	0.0217	+40	−20
48 G. Sagittarii	6.3	1.04	7.4	28 19.1	12 1.6	− 6 26.7	−0.1484	0.5750	0.0282	+ 9	−53
62 B. Sagittarii	6.0	1.05	7.2	28 41.0	12 1.8	− 6 26.5	+0.2342	0.5750	0.0282	+29	−31
58 G. Sagittarii	6.1	1.03	7.1	28 28.3	13 52.8	− 4 39.8	+0.0694	0.5741	0.0337	+20	−40
φ Sagittarii	3.3	+0.91	− 7.0	−27 4.9	23 30.3	+ 4 35.6	−0.9378	0.5688	+0.0614	−31	−90
τ Sagittarii	3.5	0.83	6.2	27 47.9	19 8 18.9	−10 55.7	+0.4673	0.5630	0.0855	+47	−18
101 B. Sagittarii	5.9	0.79	6.6	26 3.2	10 59.0	− 8 21.5	−1.1480	0.5612	0.0925	−43	−90
148 B. Sagittarii	5.7	0.73	5.8	27 9.8	18 2.8	− 1 33.2	+0.7496	0.5560	0.1104	+63	− 2
h Sagittarii	4.7	0.68	6.3	25 4.6	21 1.8	+ 1 19.3	−1.1378	0.5537	0.1177	−40	−90
108 B. Sagittarii	6.3	+0.60	− 6.2	−24 9.5	20 4 45.8	+ 8 46.9	−1.1443	0.5477	+0.1357	−38	−90
36 B. Capricorni	6.2	0.45	5.5	22 40.7	20 46.8	+ 0 15.2	−0.2943	0.5348	0.1689	+16	−62
17 Capricorni	5.8	0.38	5.3	21 49.7	21 4 38.2	+ 7 51.3	+0.1695	0.5285	0.1831	+41	−35
20 Capricorni	6.2	0.31	5.5	19 22.3	11 8.7	− 9 50.7	−1.2701	0.5235	0.1939	−43	−90
η Capricorni	4.8	0.30	5.2	20 11.8	13 28.9	− 7 34.9	+0.0845	0.5217	0.1976	+38	−40
27 Capricorni	6.1	+0.30	− 4.9	−20 54.2	15 59.8	− 5 8.7	+1.3547	0.5198	+0.2014	+69	+53

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	At Conjunction in R. A. Washington Mean Time.	Hour Angle, H	Y	x′	y′	Limiting Parallels. N.	Limiting Parallels. S.
		s	″	° ′	d h m	h m				°	°
30 Capricorni	5.4	+0.24	− 5.2	−18 20.9	21 20 12.5	− 1 3.8	−0.5660	0.5167	+0.2075	+ 7	−81
31 Capricorni	6.3	0.24	5.4	17 49.5	20 22.0	− 0 54.7	−1.1024	0.5166	0.2077	−26	−90
ι Capricorni	4.3	0.22	5.4	17 12.2	22 22.4	+ 1 2.1	−1.3619	0.5152	0.2105	−55	−90
γ Capricorni	3.8	0.16	4.8	17 3.2	22 7 27.2	+ 9 50.5	+0.4375	0.5090	0.2220	+61	−21
45 Capricorni	5.8	0.13	5.1	15 8.7	9 30.9	+11 50.6	−1.1888	0.5076	0.2244	−30	−90
δ Capricorni	3.0	+0.14	− 4.8	−16 31.2	11 3.4	−10 39.7	+0.6622	0.5066	+0.2262	+73	−10
μ Capricorni	5.2	0.10	5.1	13 57.5	14 21.0	− 7 27.8	−1.3924	0.5046	0.2297	−57	−90
ι Aquarii	4.4	0.06	4.5	14 17.3	21 18.9	− 0 42.0	+0.5936	0.5005	0.2366	+72	−14
e Aquarii	5.4	0.03	4.8	11 59.4	23 34.6	+ 1 29.9	−1.3943	0.4993	0.2387	−51	−90
42 Aquarii	5.5	+0.03	4.4	13 15.7	23 2 53.5	+ 4 43.2	+0.8001	0.4976	0.2415	+67	− 2
σ Aquarii	4.9	−0.02	− 4.3	−11 7.2	10 26.8	−11 56.2	+0.2901	0.4940	+0.2473	+57	−29
58 Aquarii	6.4	0.02	4.2	11 20.9	11 0.7	−11 23.2	+0.6816	0.4937	0.2477	+79	− 9
213 B. Aquarii	6.5	0.08	4.2	8 45.8	17 18.5	− 5 15.9	−0.5958	0.4911	0.2517	+12	−82
λ Aquarii	3.8	0.10	3.9	8 2.3	22 38.3	− 0 4.7	−0.0460	0.4891	0.2546	+40	−47
78 Aquarii	6.3	0.11	− 3.9	− 7 39.8	23 44.2	+ 0 59.4	−0.1811	0.4888	0.2552	+35	−54
				NEW	*MOON.*						
47 B. Arietis	6.5	−0.31	+ 4.8	+17 37.3	28 12 16.9	+10 37.0	−0.9540	0.5031	+0.2181	− 8	−72
20 H¹. Arietis	6.4	0.29	4.8	16 49.4	13 8.1	+11 26.7	+0.1184	0.5036	0.2171	+51	−31
26 Arietis	6.2	0.25	6.1	19 28.6	29 0 8.8	− 1 52.0	−0.5104	0.5099	0.2028	+17	−62
μ Arietis	5.7	−0.21	+ 6.6	+19 38.9	6 6.8	+ 3 55.3	+0.4839	0.5135	+0.1941	+75	−10
47 Arietis	5.8	0.15	7.3	20 19.6	13 57.4	+11 31.5	+1.2059	0.5185	0.1817	+90	+38
ε Arietis (*mean*)	4.6	0.15	7.5	20 59.9	14 31.0	−11 55.9	+0.5640	0.5189	0.1808	+82	− 4
64 Arietis	5.8	0.07	9.0	24 25.4	30 2 40.7	− 0 9.1	−1.1432	0.5269	0.1593	−26	−66
66 Arietis	6.1	0.03	8.6	22 30.6	4 41.0	+ 1 47.4	+1.2794	0.5282	0.1555	+90	+50
7 Tauri	5.9	−0.01	+ 9.2	+24 10.8	7 30.5	+ 4 31.4	−0.1271	0.5301	+0.1500	+37	−35
11 Tauri	6.1	+0.01	9.6	25 3.3	10 28.6	+ 7 23.7	−0.6536	0.5320	0.1441	+ 8	−63
16 Tauri	5.4	0.04	9.4	24 1.3	12 22.8	+ 9 14.1	+0.7526	0.5333	0.1403	+90	+11
17 Tauri	3.8	0.04	9.4	23 50.8	12 25.0	+ 9 16.2	+0.9511	0.5333	0.1402	+90	+23
18 Tauri	5.6	0.04	9.6	24 34.4	12 32.3	+ 9 23.4	+0.1695	0.5334	0.1400	+54	−19
q Tauri	4.3	+0.04	+ 9.5	+24 12.1	12 33.9	+ 9 24.9	+0.5821	0.5334	+0.1399	+85	+ 2
20 Tauri	4.1	0.05	9.5	24 6.1	12 51.4	+ 9 41.8	+0.7310	0.5336	0.1393	+90	+10
21 Tauri	5.8	0.05	9.5	24 17.4	12 53.4	+ 9 43.7	+0.5303	0.5337	0.1392	+80	− 1
22 Tauri	6.5	0.05	9.5	24 15.8	12 57.4	+ 9 47.6	+0.5685	0.5337	0.1391	+83	+ 1
23 Tauri	4.3	0.05	9.4	23 41.0	13 5.7	+ 9 55.6	+1.2245	0.5338	0.1388	+90	+46
η Tauri	3.0	+0.06	+ 9.4	+23 50.6	13 38.0	+10 26.8	+1.1240	0.5341	+0.1377	+90	+36
27 Tauri	3.7	0.07	9.5	23 47.6	14 24.9	+11 12.3	+1.2842	0.5346	0.1360	+90	+54
28 Tauri	5.2	0.07	9.5	23 52.6	14 25.5	+11 12.8	+1.1938	0.5346	0.1360	+90	+43
14 H. Tauri	5.3	0.06	9.9	25 19.4	14 55.5	+11 41.9	−0.3272	0.5349	0.1350	+26	−44
p Tauri	5.6	0.17	10.6	26 15.6	31 0 19.6	− 3 13.0	−0.1797	0.5409	0.1145	+34	−34
φ Tauri	5.0	+0.23	+11.0	+27 8.9	4 36.6	+ 0 55.2	−0.6818	0.5436	+0.1047	+ 6	−62
5 B. Aurigæ	5.7	0.36	11.6	28 27.1	13 54.7	+ 9 53.9	−1.2302	0.5490	0.0824	−41	−62
17 B. Aurigæ	6.0	+0.45	+11.4	+27 45.5	18 56.5	− 9 14.9	−0.0896	0.5517	+0.0698	+39	−25

APRIL.

The Star's Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
38 B. Aurigæ	6.5	+0.52	+11.4	+27 34.8	1 0 5.1	− 4 17.4	+0.4282	0.5542	+0.0565	+72	+ 3
47 B. Aurigæ	6.0	0.56	11.5	27 55.6	2 17.0	− 2 10.2	+0.1705	0.5552	0.0508	+55	−10
354 B. Tauri	6.4	0.63	11.4	27 52.5	7 6.3	+ 2 28.7	+0.4401	0.5573	0.0380	+74	+ 5
22 Aurigæ	6.4	0.66	11.7	28 51.5	8 6.4	+ 3 26.6	−0.5880	0.5578	0.0353	+11	−51
β Tauri	1.8	+0.68	+11.6	+28 32.3	9 21.2	+ 4 38.6	−0.2001	0.5582	+0.0319	+33	−27
107 B. Aurigæ	6.5	0.74	11.2	27 36.6	13 27.6	+ 8 36.1	+0.9103	0.5597	0.0208	+90	+33
116 B. Aurigæ	5.9	0.77	11.7	29 10.2	14 51.6	+ 9 57.0	−0.7448	0.5602	0.0169	+ 1	−61
406 B. Tauri	5.6	0.85	11.1	27 56.8	19 47.9	− 9 17.6	+0.6221	0.5617	0.0032	+90	+18
136 Tauri	4.6	0.86	10.9	27 35.8	20 47.7	− 8 20.0	+1.0000	0.5620	+0.0005	+90	+40
154 B. Aurigæ	6.4	+0.90	+11.3	+28 56.0	22 17.7	− 7 3.0	−0.4379	0.5624	−0.0033	+20	−39

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° '	d h m	h m				°	°
415 B. Tauri	6.1	+0.92	+10.9	+27 34.3	2 0 1.0	− 5 13.8	+1.0112	0.5628	−0.0085	+90	+40
183 B. Aurigæ	6.3	0.97	11.4	29 31.4	2 13.5	− 3 6.2	−1.1064	0.5633	0.0148	−27	−60
κ Aurigæ	4.4	1.04	11.1	29 32.0	5 59.3	+ 0 31.2	−1.1908	0.5640	0.0254	−37	−60
49 Aurigæ	5.1	1.17	10.2	28 5.6	14 15.5	+ 8 28.8	+0.0422	0.5650	0.0488	+47	−16
53 Aurigæ	5.6	1.20	10.4	29 3.7	15 33.9	+ 9 44.3	−1.0541	0.5651	0.0525	−22	−61
54 Aurigæ	5.8	+1.20	+10.0	+28 20.6	16 3.8	+10 13.1	−0.3158	0.5651	−0.0539	+26	−36
28 Geminorum	5.5	1.25	10.1	29 3.7	18 12.7	−11 42.8	−1.2009	0.5652	0.0599	−38	−61
47 Geminorum	5.6	1.41	8.4	27 0.1	3 5 18.5	− 1 2.0	+0.1454	0.5650	0.0910	+53	−15
53 Geminorum	5.9	1.46	8.6	28 3.0	7 11.5	+ 0 46.8	−1.1361	0.5648	0.0961	−29	−62
134 B. Geminorum	6.5	1.44	8.1	26 50.9	7 40.1	+ 1 14.3	+0.0847	0.5648	0.0974	+49	−19
59 Geminorum	5.7	+1.51	+ 8.1	+27 48.4	10 46.7	+ 4 14.0	−1.2401	0.5644	−0.1060	−42	−62
υ Geminorum	4.3	1.58	7.3	27 5.4	15 32.1	+ 8 48.7	−1.0182	0.5637	0.1188	−17	−63
c Geminorum	5.5	1.61	6.6	25 59.5	18 58.8	−11 52.3	−0.2923	0.5630	0.1279	+28	−41
κ Geminorum	3.7	1.59	6.1	24 36.4	19 8.5	−11 43.0	+1.1343	0.5630	0.1283	+90	+39
ω Cancri	5.9	1.71	5.6	25 37.8	4 2 3.0	− 5 3.8	−0.8831	0.5615	0.1462	− 6	−64
5 B. Cancri	6.4	+1.68	+ 4.9	+23 49.3	2 6.9	− 5 0.0	+0.9899	0.5614	−0.1464	+90	+26
4 Cancri	6.2	1.71	5.4	25 19.7	2 23.6	− 4 43.9	−0.6190	0.5614	0.1471	+10	−61
35 B. Cancri	6.4	1.75	4.1	23 23.9	7 28.8	+ 0 10.1	+0.6048	0.5600	0.1598	+87	+ 2
λ Cancri	5.9	1.81	4.0	24 17.7	10 22.2	+ 2 57.1	−0.7956	0.5592	0.1669	0	−66
γ Cancri	4.7	1.88	+ 1.8	21 46.7	20 7.7	−11 38.6	+0.0605	0.5563	0.1896	+48	−29
12 B. Leonis	6.3	+2.02	− 2.2	+16 57.4	5 14 32.5	+ 6 6.7	+1.1279	0.5505	−0.2275	+90	+27
8 Leonis	5.9	2.07	3.0	16 49.4	19 36.4	+10 59.9	+0.0860	0.5490	0.2367	+49	−32
α Leonis	1.3	2.11	6.3	12 23.2	6 9 35.7	+ 0 30.1	+1.0805	0.5455	0.2588	+90	+19
34 Leonis	6.4	2.16	6.1	13 46.7	11 2.2	+ 1 53.5	−0.6902	0.5451	0.2607	+ 8	−77
45 Leonis	5.8	2.15	8.0	10 11.9	18 15.7	+ 8 52.2	+0.9707	0.5438	0.2700	+90	+10
ρ Leonis	3.8	+2.16	− 8.4	+ 9 44.8	20 35.6	+11 7.3	+0.7874	0.5434	−0.2727	+90	− 1
49 Leonis	5.7	2.16	8.7	9 5.6	21 36.3	−11 54.2	+1.1628	0.5433	0.2739	+90	+23
56 Leonis	6.1	2.19	10.4	6 38.5	7 7 6.9	− 2 43.0	+0.9426	0.5424	0.2831	+90	+ 7
c Leonis	5.1	2.20	10.7	6 33.6	9 15.5	− 0 38.8	+0.4134	0.5423	0.2849	+68	−22
χ Leonis	4.7	2.23	10.7	7 47.9	11 12.3	+ 1 14.0	−1.3669	0.5422	0.2863	−41	−82
80 Leonis	6.4	+2.24	−12.4	+ 4 19.8	20 39.0	+10 21.4	−0.6722	0.5425	−0.2920	+10	−85
83 Leonis	6.3	2.22	12.6	3 28.7	21 5.9	+10 47.5	+0.0366	0.5425	0.2922	+46	−42
τ Leonis	5.2	2.23	12.7	3 19.6	21 36.1	+11 16.5	+0.0389	0.5425	0.2924	+46	−42
89 Leonis	5.7	2.25	13.0	3 32.1	8 0 31.5	− 9 54.0	−1.0214	0.5428	0.2936	−10	−86
9 B. Virginis	6.2	2.24	14.1	+ 0 9.3	7 9.5	− 3 29.6	+0.3469	0.5437	0.2952	+64	−27
31 B. Virginis	6.4	+2.25	−14.8	− 1 17.5	12 33.7	+ 1 43.5	+0.1694	0.5448	−0.2956	+53	−35
162 B. Virginis	6.2	2.26	16.0	4 8.6	9 0 33.4	−10 41.6	−0.5735	0.5482	0.2931	+15	−79
200 B. Virginis	6.3	2.27	16.2	4 35.0	2 14.0	− 9 4.5	−0.6354	0.5488	0.2924	+11	−85
f Virginis	6.0	2.28	16.4	5 21.8	4 30.4	− 6 52.9	−0.5368	0.5496	0.2913	+16	−77
χ Virginis	4.8	2.26	16.6	7 31.6	5 35.3	− 5 50.2	+1.2636	0.5500	0.2907	+82	+29
ψ Virginis	5.0	+2.27	−17.0	− 9 4.6	12 12.7	+ 0 33.2	+0.8650	0.5528	−0.2863	+81	+ 1
49 Virginis	5.2	2.28	17.2	10 17.1	18 5.4	+ 6 13.4	+0.3765	0.5554	0.2812	+62	−25
g Virginis	5.6	2.30	17.2	8 31.7	18 22.8	+ 6 30.1	−1.4204	0.5556	0.2809	−56	−90
50 Virginis	6.2	2.29	17.2	9 52.5	18 53.8	+ 7 0.0	−0.2502	0.5558	0.2804	+29	−58
α Virginis	1.2	2.30	17.5	10 43.1	10 1 31.2	−10 37.0	−1.2619	0.5592	0.2731	−33	−90
i Virginis	5.7	+2.30	−17.5	−12 15.9	2 9.9	− 9 59.6	+0.0739	0.5595	−0.2723	+44	−41
550 B. Virginis	6.0	2.30	17.5	12 46.7	5 32.2	− 6 44.7	−0.3353	0.5614	0.2679	+23	−63
85 Virginis	6.1	2.31	17.5	15 20.4	10 6.9	− 2 20.1	+0.9577	0.5640	0.2614	+75	+ 8
214 G. Virginis	6.5	2.32	17.4	15 55.8	18 16.4	+ 5 31.1	−0.5453	0.5687	0.2480	+10	−79
40 H. Virginis	5.1	2.32	17.4	15 54.1	20 34.8	+ 7 44.3	−1.1407	0.5700	0.2438	−27	−90
43 H. Virginis	5.5	+2.33	−17.2	−17 48.3	22 26.0	+ 9 31.3	+0.2769	0.5712	−0.2403	+51	−29
231 G. Virginis	6.4	2.33	17.2	18 11.5	23 6.4	+10 10.2	+0.4943	0.5714	0.2389	+63	−18
236 G. Virginis	5.7	2.33	17.2	18 19.4	23 45.0	+10 47.3	+0.4704	0.5719	0.2378	+61	−20
9 G. Libræ	6.5	2.34	16.8	20 4.0	11 6 17.2	− 6 55.5	+0.6737	0.5758	0.2243	+70	− 8
17 G. Libræ	6.4	2.34	16.6	20 49.0	10 48.8	− 2 34.4	+0.4191	0.5784	0.2142	+56	−22
18 G. Libræ	6.1	+2.34	−16.5	−20 58.2	11 13.6	− 2 10.7	+0.4814	0.5786	−0.2132	+59	−18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Par allels	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
43 B. Libræ	5.7	+2.36	−16.8	−21 2.0	11 15 14.3	+ 1 40.6	−0.2920	0.5809	−0.2037	+18	−61
47 G. Libræ	6.1	2.34	16.0	21 42.1	18 48.3	+ 5 6.2	−0.3430	0.5828	0.1949	+14	−6
64 G. Libræ	5.8	2.34	15.7	22 5.2	22 41.0	+ 8 49.6	−0.7008	0.5848	0.1849	− 5	−90
153 B. Libræ	6.3	2.34	14.9	24 12.1	12 5 8.9	− 8 58.2	+0.2572	0.5877	0.1673	+42	−30
42 Libræ	5.0	2.33	14.8	23 32.6	7 53.9	− 6 19.8	−0.8470	0.5888	0.1595	−16	−90
b Scorpii	4.7	+2.34	−14.1	−25 29.7	11 57.9	− 2 25.7	+0.4700	0.5904	−0.1477	+52	−18
A Scorpii	4.6	2.34	14.1	25 4.5	12 58.5	− 1 27.7	−0.0960	0.5907	0.1447	+22	−50
31 B. Scorpii	5.4	2.32	14.2	24 16.9	13 5.7	− 1 20.8	−0.9041	0.5907	0.1444	−21	−90
3 Scorpii	5.9	2.32	14.0	24 59.6	13 22.5	− 1 4.6	−0.2348	0.5908	0.1435	+15	−5
4 Scorpii	5.7	2.33	13.8	26 1.0	13 41.0	− 0 46.9	+0.7419	0.5909	0.1426	+63	−
40 B. Scorpii	5.4	+2.31	−14.0	−24 35.3	14 52.4	+ 0 21.5	−0.8516	0.5913	−0.1391	−19	−90
π Scorpii	3.0	2.33	13.7	25 52.3	14 57.6	+ 0 26.6	+0.4174	0.5914	0.1388	+48	−21
48 B. Scorpii	4.9	2.32	13.6	25 37.8	16 40.3	+ 2 5.0	−0.0565	0.5918	0.1336	+23	−4
50 B. Scorpii	6.4	2.30	13.8	24 29.6	16 54.0	+ 2 18.2	−1.2226	0.5919	0.1329	−48	−90
65 B. Scorpii	5.5	2.32	13.3	26 6.0	18 28.4	+ 3 48.6	+0.1780	0.5923	0.1281	+34	−34
85 B. Scorpii	6.0	+2.30	−13.3	−25 15.8	21 2.9	+ 6 16.9	−0.9808	0.5929	−0.1202	−29	−90
σ Scorpii	3.1	2.29	13.0	25 23.5	23 25.6	+ 8 33.6	−1.1309	0.5934	0.1128	−41	−90
α Scorpii	1.2	2.28	12.5	26 14.7	13 2 30.9	+11 31.3	−0.6078	0.5938	0.1030	− 9	−89
116 B. Scorpii	6.2	2.28	12.4	26 21.3	3 15.5	−11 45.9	−0.5740	0.5939	0.1007	− 7	−85
τ Scorpii	2.9	2.29	11.8	28 2.5	4 55.6	−10 10.0	+0.9600	0.5941	0.0953	+62	+13
134 B. Scorpii	6.4	+2.26	−11.6	−27 17.9	8 6.2	− 7 7.3	−0.0745	0.5943	−0.0851	+17	−49
135 B. Scorpii	6.0	2.28	11.3	28 21.2	8 21.4	− 6 52.7	+0.9681	0.5943	0.0843	+62	+14
95 G. Ophiuchi	6.1	2.20	10.2	27 39.6	18 41.1	+ 3 1.3	−0.4302	0.5936	0.0507	− 4	−72
43 Ophiuchi	5.4	2.17	9.6	28 3.8	22 48.5	+ 6 58.4	−0.2016	0.5928	0.0372	+ 7	−57
163 G. Ophiuchi	6.3	2.11	8.8	27 50.8	14 6 22.5	− 9 46.3	−0.6137	0.5904	0.0126	−17	−90
X Sagittarii (*var.*)	4.4	+2.09	− 8.6	−27 48.1	8 0.2	− 8 12.6	−0.6763	0.5898	−0.0073	−20	−90
10 G. Sagittarii	5.7	2.06	8.0	28 3.3	11 29.7	− 4 51.6	−0.4242	0.5883	+0.0039	− 7	−72
210 B. Scorpii	5.8	2.07	7.7	28 45.1	12 14.1	− 4 9.0	+0.2969	0.5880	0.0062	+30	−17
W Sagittarii (*var.*)	4.3	2.06	7.1	29 35.2	14 40.3	− 1 48.8	+1.1812	0.5868	0.0139	+60	+36
38 B. Sagittarii	4.7	2.03	7.3	28 28.2	15 52.4	− 0 39.6	+0.0498	0.5862	0.0177	+18	−41
C. D.−28° 14268	6.4	+2.02	− 7.0	−28 55.4	17 22.2	+ 0 46.7	+0.5474	0.5853	+0.0224	+48	−13
48 G. Sagittarii	6.3	1.99	7.0	28 19.1	19 29.0	+ 2 48.3	−0.0213	0.5841	0.0289	+15	−45
62 B. Sagittarii	6.0	2.00	6.8	28 41.0	19 29.2	+ 2 48.5	+0.3556	0.5841	0.0289	+36	−24
58 G. Sagittarii	6.1	1.98	6.6	28 28.3	21 17.0	+ 4 32.0	+0.1939	0.5830	0.0345	+27	−33
φ Sagittarii	3.3	1.86	5.9	27 4.9	15 6 38.6	−10 28.6	−0.7956	0.5767	0.0624	−22	−90
σ Sagittarii	2.1	+1.80	− 5.6	−26 24.4	10 30.7	− 6 45.6	−1.2394	0.5738	+0.0735	−55	−90
τ Sagittarii	3.5	1.77	4.6	27 47.9	15 14.0	− 2 13.1	+0.5931	0.5700	0.0866	+55	−11
201 B. Sagittarii	5.9	1.72	4.8	26 3.2	17 50.3	+ 0 17.2	−1.0010	0.5678	0.0937	−32	−90
248 B. Sagittarii	5.7	1.66	3.6	27 9.8	16 0 44.8	+ 6 56.3	+0.8750	0.5619	0.1116	+63	+ 7
51 Sagittarii	5.8	1.59	4.1	24 54.6	3 23.2	+ 9 29.0	−1.1988	0.5595	0.1182	−46	−90
h Sagittarii	4.7	+1.59	− 4.0	−25 4.5	3 40.1	+ 9 45.2	−0.9900	0.5593	+0.1189	−29	−90
308 B. Sagittarii	6.3	1.49	3.6	24 9.4	11 15.4	− 6 56.0	−0.9964	0.5523	0.1367	−27	−90
36 B. Capricorni	6.2	1.29	2.3	22 40.7	17 3 1.8	+ 8 17.7	−0.1554	0.5377	0.1695	+23	−53
17 Capricorni	5.8	1.20	1.8	21 49.7	10 47.7	− 8 11.8	+0.3041	0.5306	0.1835	+48	−28
20 Capricorni	6.2	1.10	2.0	19 22.2	17 14.4	− 1 57.6	−1.1271	0.5250	0.1940	−29	−90
η Capricorni	4.8	+1.08	− 1.5	−20 11.8	19 33.4	+ 0 17.0	+0.2180	0.5230	+0.1976	+45	−33
30 Capricorni	5.4	0.99	1.5	18 20.8	18 2 14.2	+ 6 45.3	−0.4307	0.5175	0.2072	+14	−71
31 Capricorni	6.3	0.98	1.7	17 49.4	2 23.6	+ 6 54.4	−0.9642	0.5174	0.2075	−16	−90
ι Capricorni	4.3	0.96	1.7	17 12.1	4 23.2	+ 8 50.3	−1.2233	0.5158	0.2102	−35	−90
γ Capricorni	3.8	0.87	0.9	17 3.1	13 25.5	− 6 23.7	+0.5633	0.5089	0.2214	+68	−15
45 Capricorni	5.8	+0.83	− 1.3	−15 8.7	15 28.8	− 4 24.1	−1.0572	0.5075	+0.2237	−19	−90
δ Capricorni	3.0	0.83	0.8	16 31.1	17 1.0	− 2 54.6	+0.7854	0.5064	0.2254	+67	−
μ Capricorni	5.2	0.78	1.3	13 57.5	20 18.0	+ 0 16.6	−1.2632	0.5042	0.2288	−36	−90
ι Aquarii	4.4	0.71	0.6	14 17.3	19 3 15.2	+ 7 1.7	+0.7117	0.4998	0.2355	+76	− 7
e Aquarii	5.4	0.67	1.1	11 59.3	5 30.8	+ 9 13.5	−1.2721	0.4985	0.2375	−35	−90
42 Aquarii	5.5	+0.65	− 0.5	−13 15.6	8 49.6	−11 33.3	+0.9140	0.4966	+0.2402	+77	+ 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
σ Aquarii	4.9	+0.57	− 0.5	−11 7.1	**19** 16 23.0	− 4 12.6	+0.3995	0.4928	+0.2458	+63	−24
58 Aquarii	6.4	0.57	0.4	11 20.8	16 57.0	− 3 39.5	+0.7898	0.4925	0.2462	+72	− 3
113 B. Aquarii	6.5	0.49	0.6	8 45.7	23 15.2	+ 2 28.2	−0.4909	0.4898	0.2500	+17	−74
λ Aquarii	3.8	0.44	0.4	8 2.3	**20** 4 35.6	+ 7 40.1	+0.0530	0.4877	0.2528	+45	−42
78 Aquarii	6.3	0.43	0.5	7 39.7	5 41.5	+ 8 44.1	−0.0830	0.4874	0.2533	+39	−49
81 Aquarii	6.4	+0.40	− 0.2	− 7 31.4	9 32.2	−11 31.3	+0.7410	0.4861	+0.2550	+81	− 6
82 Aquarii	6.4	0.39	0.3	7 2.2	10 11.3	−10 53.3	+0.3692	0.4859	0.2553	+64	−25
193 B. Aquarii	5.5	0.31	− 0.5	3 57.9	17 35.6	− 3 40.8	−1.1259	0.4840	0.2578	−18	−90
96 Aquarii	5.7	0.32	+ 0.1	5 35.7	19 45.5	− 1 34.4	+1.2359	0.4835	0.2584	+84	+26
316 B. Aquarii	6.5	0.30	− 0.2	4 23.3	20 15.2	− 1 5.5	+0.0278	0.4834	0.2586	+45	−43
13 Piscium	6.4	+0.23	− 0.3	− 1 33.7	**21** 2 58.3	+ 5 26.9	−1.3618	0.4823	+0.2599	−40	−90
14 Piscium	5.9	0.22	− 0.2	− 1 43.4	4 13.5	+ 6 40.2	−0.8572	0.4822	0.2601	0	−90
21 Piscium	5.6	0.15	0.0	+ 0 35.9	13 2.5	− 8 44.8	−1.1361	0.4816	0.2607	−18	−89
60 B. Piscium	6.0	+0.15	+ 0.6	− 0 22.1	16 6.5	− 5 45.6	+0.7375	0.4815	0.2607	+84	− 6
51 Piscium	5.6	−0.01	1.0	+ 6 28.9	**22** 13 43.7	− 8 42.4	−1.2695	0.4836	0.2567	−30	−84
				NEW	*MOON.*						
16 Tauri	5.4	−0.09	+ 8.0	+24 1.3	**26** 18 7.2	− 7 14.1	+0.6332	0.5359	+0.1396	+90	+ 5
17 Tauri	3.8	0.09	8.0	23 50.8	18 9.4	− 7 12.0	+0.8318	0.5359	0.1395	+90	+16
18 Tauri	5.6	0.09	8.1	24 34.4	18 16.7	− 7 4.9	+0.0497	0.5360	0.1393	+47	−25
q Tauri	4.3	−0.09	+ 8.1	+24 12.0	18 18.3	− 7 3.4	+0.4625	0.5360	+0.1392	+74	− 4
20 Tauri	4.1	0.08	8.1	24 6.1	18 35.7	− 6 46.5	+0.6111	0.5362	0.1386	+88	+ 4
21 Tauri	5.8	0.09	8.1	24 17.3	18 37.8	− 6 44.5	+0.4102	0.5362	0.1385	+70	− 7
22 Tauri	6.5	0.09	8.1	24 15.8	18 41.7	− 6 40.7	+0.4484	0.5362	0.1384	+73	− 5
23 Tauri	4.3	0.08	8.0	23 41.0	18 50.0	− 6 32.7	+1.1044	0.5364	0.1381	+90	+35
η Tauri	3.0	−0.08	+ 8.1	+23 50.5	19 22.2	− 6 1.6	+1.0034	0.5367	+0.1370	+90	+27
27 Tauri	3.7	0.07	8.1	23 47.6	20 8.9	− 5 16.4	+1.1628	0.5372	0.1354	+90	+40
28 Tauri	5.2	0.07	8.1	23 52.6	20 9.5	− 5 15.9	+1.0723	0.5372	0.1354	+90	+33
14 H. Tauri	5.3	0.08	8.3	25 19.4	20 39.4	− 4 46.9	−0.4500	0.5375	0.1343	+19	−51
p Tauri	5.6	−0.01	9.0	26 15.6	**27** 6 2.0	+ 4 16.8	−0.3133	0.5433	0.1137	+27	−41
φ Tauri	5.0	+0.02	+ 9.3	+27 8.9	10 18.5	+ 8 24.5	−0.8209	0.5458	+0.1039	− 3	−63
χ Tauri	5.3	0.04	9.1	25 25.8	11 20.1	+ 9 24.1	+1.1664	0.5464	0.1015	+90	+44
17 B. Aurigæ	6.0	0.17	10.0	27 45.4	**28** 0 38.2	− 1 45.8	−0.2428	0.5531	0.0689	+30	−33
38 B. Aurigæ	6.5	0.23	10.0	27 34.8	5 47.4	+ 3 12.4	+0.2716	0.5553	0.0556	+61	− 5
47 B. Aurigæ	6.0	0.25	10.1	27 55.5	7 59.6	+ 5 19.8	+0.0111	0.5562	0.0499	+45	−18
354 B. Tauri	6.4	+0.31	+10.2	+27 52.4	12 49.9	+ 9 59.7	+0.2775	0.5579	+0.0370	+61	− 3
22 Aurigæ	6.4	0.33	10.4	28 51.5	13 50.3	+10 58.0	−0.7556	0.5583	0.0344	0	−61
β Tauri	1.8	0.34	10.3	28 32.3	15 5.3	−11 49.8	−0.3673	0.5586	0.0311	+23	−37
107 B. Aurigæ	6.5	0.40	10.1	27 36.6	19 13.1	− 7 50.9	+0.7445	0.5598	0.0198	+90	+23
116 B. Aurigæ	5.9	0.42	10.5	29 10.2	20 37.6	− 6 29.5	−0.9194	0.5602	0.0160	−11	−61
106 B. Tauri	5.6	+0.48	+10.2	+27 56.8	**29** 1 35.9	− 1 42.2	+0.4502	0.5613	+0.0024	+74	+ 9
136 Tauri	4.6	0.50	10.0	27 35.7	2 36.2	− 0 44.1	+0.8294	0.5614	−0.0004	+90	+29
154 B. Aurigæ	6.4	0.52	10.4	28 55.9	3 56.9	+ 0 33.6	−0.6172	0.5616	0.0041	+ 9	−52
115 B. Tauri	6.1	0.54	10.0	27 34.3	5 51.1	+ 2 23.7	+0.8385	0.5619	0.0093	+90	+29
49 Aurigæ	5.1	0.75	9.7	28 5.6	20 15.2	− 7 44.1	−0.1462	0.5626	0.0492	+36	−26
53 Aurigæ	5.6	+0.78	+ 9.9	+29 3.7	21 34.6	− 6 27.6	−1.2518	0.5626	−0.0528	−47	−61
54 Aurigæ	5.8	0.78	9.7	28 20.6	22 4.8	− 5 58.5	−0.5082	0.5626	0.0542	+14	−47
39 Geminorum	6.2	0.88	8.6	26 11.8	**30** 6 14.2	+ 1 52.9	+1.2509	0.5618	0.0765	+90	+56
47 Geminorum	5.6	0.97	8.5	27 0.1	11 32.5	+ 6 59.5	−0.0511	0.5610	0.0907	+41	−25
134 B. Geminorum	6.5	1.01	8.2	26 50.9	13 56.8	+ 9 18.6	−0.1135	0.5605	0.0971	+38	−29
υ Geminorum	4.3	+1.14	+ 7.7	+27 5.4	21 58.5	− 6 57.3	−1.2321	0.5585	−0.1180	−39	−63

MAY.

c Geminorum	5.5	+1.17	+ 7.1	+25 59.5	**1** 1 29.8	− 3 33.8	−0.4995	0.5575	−0.1269	+16	−53
κ Geminorum	3.7	+1.16	+ 6.6	+24 36.4	1 39.7	− 3 24.2	+0.9430	0.5575	−0.1274	+90	+25

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ω Cancri	5.9	+1.28	+ 6.3	+25 37.8	1 8 44.2	+ 3 24.9	−1.1001	0.5552	−0.1448	−23	−64
5 B. Cancri	6.4	1.25	5.6	23 49.3	8 48.1	+ 3 28.7	+0.7957	0.5552	0.1449	+90	+14
4 Cancri	6.2	1.28	6.2	25 19.7	9 5.3	+ 3 45.3	−0.8329	0.5551	0.1456	− 3	−65
35 B. Cancri	6.4	1.33	5.0	23 23.9	14 18.3	+ 8 47.1	+0.4050	0.5533	0.1580	+69	− 9
λ Cancri	5.9	1.38	5.0	24 17.7	17 16.4	+11 38.9	−1.0142	0.5522	0.1648	−15	−66
γ Cancri	4.7	+1.48	+ 3.0	+21 46.8	2 3 18.9	− 2 39.8	−0.1476	0.5485	−0.1868	+36	−39
12 B. Leonis	6.3	1.66	− 0.9	16 57.4	22 19.0	− 8 19.0	+0.9402	0.5415	0.2232	+90	+13
8 Leonis	5.9	1.72	1.6	16 49.4	3 3 33.2	− 3 15.5	−0.1156	0.5398	0.2321	+38	−43
α Leonis	1.3	1.81	4.9	12 23.2	18 1.6	+10 43.8	+0.9045	0.5359	0.2533	+90	+ 7
34 Leonis	6.4	1.85	4.6	13 46.7	19 31.2	−11 49.6	−0.8938	0.5356	0.2552	− 4	−76
45 Leonis	5.8	+1.88	− 6.7	+10 12.0	4 3 0.0	− 4 35.6	+0.8011	0.5342	−0.2642	+90	0
ρ Leonis	3.8	1.90	7.1	9 44.9	5 24.8	− 2 15.6	+0.6174	0.5339	0.2668	+84	−10
49 Leonis	5.7	1.90	7.4	9 5.6	6 27.6	− 1 14.9	+1.0001	0.5338	0.2679	+90	+12
56 Leonis	6.1	1.96	9.3	6 38.5	16 17.8	+ 8 15.9	+0.7879	0.5331	0.2769	+90	− 2
c Leonis	5.1	1.98	9.6	6 33.7	18 30.7	+10 24.4	+0.2534	0.5331	0.2787	+58	−30
80 Leonis	6.4	+2.07	−11.5	+ 4 19.8	5 6 16.4	− 2 13.2	−0.8306	0.5339	−0.2858	+ 1	−86
83 Leonis	6.3	2.05	11.7	3 28.7	6 44.1	− 1 46.3	−0.1107	0.5339	0.2860	+38	−50
τ Leonis	5.2	2.07	11.9	3 19.6	7 15.3	− 1 16.1	−0.1074	0.5340	0.2862	+39	−50
89 Leonis	5.7	2.10	12.1	3 32.1	10 16.0	+ 1 38.6	−1.1777	0.5344	0.2874	−21	−86
9 B. Virginis	6.2	2.12	13.6	+ 0 9.3	17 5.6	+ 8 14.6	+0.2221	0.5359	0.2891	+56	−33
31 B. Virginis	6.4	+2.16	−14.5	− 1 17.5	22 38.8	−10 23.3	+0.0528	0.5374	−0.2897	+47	−41
162 B. Virginis	6.2	2.24	16.0	4 8.6	6 10 56.1	+ 1 29.2	−0.6733	0.5420	0.2878	+ 9	−89
200 B. Virginis	6.3	2.26	16.2	4 35.0	12 38.9	+ 3 8.5	−0.7320	0.5429	0.2872	+ 6	−90
f Virginis	6.0	2.27	16.6	5 21.8	14 58.3	+ 5 23.1	−0.6271	0.5439	0.2862	+11	−84
χ Virginis	4.8	2.26	17.1	7 31.6	16 4.5	+ 6 27.1	+1.1940	0.5445	0.2857	+82	+23
ψ Virginis	5.0	+2.32	−17.7	− 9 4.6	22 49.3	−11 2.1	+0.8054	0.5480	−0.2817	+70	− 2
49 Virginis	5.2	2.36	18.1	10 17.2	7 4 47.7	− 5 16.1	+0.3258	0.5515	0.2770	+59	−27
50 Virginis	6.2	2.38	18.0	9 52.6	5 36.8	− 4 28.8	−0.3039	0.5520	0.2763	+26	−61
α Virginis	1.2	2.43	18.4	10 43.1	12 19.2	+ 1 59.3	−1.3060	0.5563	0.2694	−38	−90
i Virginis	5.7	2.43	18.6	12 15.9	12 58.4	+ 2 37.1	+0.0396	0.5568	0.2686	+42	−42
550 B. Virginis	6.0	+2.46	−18.7	−12 46.7	16 22.7	+ 5 54.1	−0.3639	0.5591	−0.2645	+21	−65
85 Virginis	6.1	2.49	19.0	15 20.5	20 59.7	+10 20.9	+0.9459	0.5624	0.2583	+75	+ 7
214 G. Virginis	6.5	2.56	19.0	15 55.8	8 5 11.7	− 5 45.3	−0.5437	0.5683	0.2455	+10	−78
40 H. Virginis	5.1	2.57	18.9	15 54.1	7 30.5	− 3 31.8	−1.1348	0.5700	0.2415	−27	−90
43 H. Virginis	5.5	2.59	19.0	17 48.3	9 21.9	− 1 44.6	+0.2900	0.5714	0.2381	+52	−29
231 G. Virginis	6.4	+2.60	−19.0	−18 11.5	10 2.3	− 1 5.7	+0.5093	0.5720	−0.2369	+64	−17
236 G. Virginis	5.7	2.60	19.0	18 19.4	10 40.9	− 0 28.5	+0.4867	0.5724	0.2356	+61	−18
9 G. Libræ	6.5	2.66	18.8	20 4.1	17 12.8	+ 5 48.3	+0.7041	0.5772	0.2226	+70	− 6
17 G. Libræ	6.4	2.70	18.6	20 49.0	21 43.5	+10 8.5	+0.4590	0.5806	0.2127	+58	−20
18 G. Libræ	6.1	2.70	18.6	20 58.2	22 8.1	+10 32.0	+0.5221	0.5808	0.2118	+61	−16
43 B. Libræ	5.7	+2.75	−18.9	−21 2.0	9 2 7.6	− 9 37.9	−0.2414	0.5837	−0.2025	+20	−58
47 G. Libræ	6.1	2.75	18.0	21 42.2	5 40.0	− 6 13.9	−0.2844	0.5861	0.1938	+17	−61
64 G. Libræ	5.8	2.78	17.6	22 5.2	9 30.6	− 2 32.5	−0.6326	0.5886	0.1839	− 2	−89
153 B. Libræ	6.3	2.83	17.0	24 12.2	15 54.2	+ 3 35.4	+0.3349	0.5925	0.1666	+46	−26
169 B. Libræ	6.0	2.82	16.8	22 51.7	17 41.2	+ 5 18.0	−1.2834	0.5935	0.1615	−53	−90
42 Libræ	5.0	+2.84	−16.8	−23 32.6	18 37.1	+ 6 11.7	−0.7581	0.5941	−0.1588	−12	−90
b Scorpii	4.7	2.88	16.1	25 29.7	22 37.6	+10 2.1	+0.5594	0.5961	0.1471	+57	−13
A Scorpii	4.6	2.88	16.0	25 4.5	23 37.3	+10 59.4	−0.0011	0.5965	0.1441	+26	−44
31 B. Scorpii	5.4	2.86	16.0	24 16.9	23 44.4	+11 6.2	−0.8040	0.5966	0.1437	−16	−90
3 Scorpii	5.9	2.88	16.0	24 59.6	10 0 0.9	+11 22.0	−0.1383	0.5967	0.1429	+19	−52
4 Scorpii	5.7	+2.89	−15.9	−26 1.1	0 19.2	+11 39.6	+0.8328	0.5969	−0.1420	+64	+ 3
40 B. Scorpii	5.4	2.87	15.8	24 35.3	1 29.4	−11 13.3	−0.7481	0.5974	0.1385	−13	−90
π Scorpii	3.0	2.90	15.7	25 52.3	1 34.5	−11 8.3	+0.5126	0.5974	0.1382	+54	−16
48 B. Scorpii	4.9	2.90	15.5	25 37.8	3 15.6	− 9 31.5	+0.0452	0.5982	0.1331	+28	−42
50 B. Scorpii	6.4	2.88	15.6	24 29.7	3 29.0	− 9 18.6	−1.1123	0.5982	0.1324	−38	−90
65 B. Scorpii	5.5	+2.92	−15.2	−26 6.1	5 1.8	− 7 49.7	+0.2813	0.5989	−0.1276	+40	−29

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
85 B. Scorpii	6.0	+2.90	−15.0	−25 15.8	10 7 33.6	− 5 24.3	−0.8638	0.5997	−0.1196	−21	−90
σ Scorpii	3.1	2.91	14.6	25 23.5	9 53.6	− 3 10.2	−1.0081	0.6005	0.1122	−31	−90
α Scorpii	1.2	2.93	14.1	26 14.8	12 55.4	− 0 16.1	−0.4834	0.6013	0.1024	− 2	−76
116 B. Scorpii	6.2	2.93	13.9	26 21.3	13 39.0	+ 0 25.7	−0.4485	0.6014	0.1001	0	−73
τ Scorpii	2.9	2.97	13.5	28 2.5	15 17.2	+ 1 59.7	+1.0748	0.6018	0.0947	+62	+23
134 B. Scorpii	6.4	+2.95	−13.1	−27 17.9	18 23.8	+ 4 58.4	+0.0551	0.6023	−0.0845	+24	−41
135 B. Scorpii	6.0	2.97	12.9	28 21.2	18 38.6	+ 5 12.6	+1.0882	0.6023	0.0836	+62	+24
95 G. Ophiuchi	6.1	2.95	11.3	27 39.6	11 4 44.3	− 9 7.4	−0.2791	0.6024	0.0498	+ 4	−61
43 Ophiuchi	5.4	2.95	10.4	28 3.8	8 45.6	− 5 16.4	−0.0464	0.6018	0.0362	+14	−47
163 G. Ophiuchi	6.3	2.92	9.1	27 50.8	16 8.1	+ 1 47.5	−0.4417	0.5999	0.0113	− 8	−73
X Sagittarii (*var.*)	4.4	+2.91	− 8.8	−27 48.1	17 43.2	+ 3 18.5	−0.5010	0.5993	−0.0060	−11	−78
10 G. Sagittarii	5.7	2.91	8.2	28 3.3	21 7.1	+ 6 33.9	−0.2467	0.5979	+0.0053	+ 2	−59
210 B. Scorpii	5.8	2.92	7.8	28 45.1	21 50.4	+ 7 15.4	+0.4666	0.5975	0.0077	+41	−18
38 B. Sagittarii	4.7	2.89	7.2	28 28.2	12 1 22.7	+10 38.7	+0.2277	0.5958	0.0193	+28	−31
C. D.−28° 14268	6.4	2.89	6.9	28 55.4	2 50.1	−11 57.5	+0.7211	0.5950	0.0241	+61	− 2
48 G. Sagittarii	6.3	+2.87	− 6.7	−28 19.1	4 53.4	− 9 59.3	+0.1626	0.5938	+0.0307	+25	−35
62 B. Sagittarii	6.0	2.88	6.5	28 41.0	4 53.6	− 9 59.1	+0.5346	0.5938	0.0307	+47	−14
66 B. Sagittarii	4.7	2.84	6.8	27 4.6	5 9.9	− 9 43.5	−1.0960	0.5937	0.0316	−45	−90
58 G. Sagittarii	6.1	2.86	6.2	28 28.3	6 38.4	− 8 18.6	+0.3775	0.5928	0.0363	−38	−23
69 G. Sagittarii	6.3	2.80	6.2	26 48.7	8 59.5	− 6 3.3	−1.2252	0.5912	0.0438	−55	−90
φ Sagittarii	3.3	+2.76	− 4.8	−27 4.9	15 44.4	+ 0 25.2	−0.5864	0.5863	+0.0646	−10	−86
σ Sagittarii	2.1	2.71	4.3	26 24.3	19 30.1	+ 4 1.8	−1.0192	0.5833	0.0758	−35	−90
τ Sagittarii	3.5	2.70	3.2	27 47.9	13 0 5.5	+ 8 26.3	+0.7944	0.5794	0.0890	+62	+ 2
201 B. Sagittarii	5.9	2.64	3.1	26 3.2	2 37.5	+10 52.3	−0.7750	0.5771	0.0961	−18	−90
248 B. Sagittarii	5.7	2.60	1.6	27 9.8	9 20.6	− 6 40.1	+1.0835	0.5709	0.1142	+63	+23
51 Sagittarii	5.8	+2.52	− 1.8	−24 54.5	11 54.6	− 4 11.8	−0.9595	0.5683	+0.1208	−27	−90
h Sagittarii	4.7	2.52	1.7	25 4.5	12 11.2	− 3 55.9	−0.7532	0.5681	0.1214	−14	−90
308 B. Sagittarii	6.3	2.42	− 0.9	24 9.4	19 34.3	+ 3 10.7	−0.7520	0.5606	0.1394	−12	−90
36 B. Capricorni	6.2	2.22	+ 1.2	22 40.6	14 10 57.0	− 5 59.3	+0.0915	0.5449	0.1721	+35	−39
17 Capricorni	5.8	2.12	2.0	21 49.6	18 32.1	+ 1 20.3	+0.5507	0.5372	0.1859	+62	−14
20 Capricorni	6.2	+1.99	+ 2.1	−19 22.1	15 0 50.4	+ 7 26.0	−0.8604	0.5310	+0.1963	−11	−90
η Capricorni	4.8	1.98	2.6	20 11.7	3 6.6	+ 9 37.9	+0.4707	0.5288	0.1998	+59	−19
114 B. Capricorni	6.1	1.88	2.5	17 42.0	8 16.9	− 9 21.7	−1.1451	0.5240	0.2074	−29	−90
30 Capricorni	5.4	1.88	2.9	18 20.7	9 39.4	− 8 1.9	−0.1683	0.5227	0.2093	+27	−54
31 Capricorni	6.3	1.87	2.7	17 49.4	9 48.6	− 7 53.0	−0.6962	0.5226	0.2095	0	−90
ι Capricorni	4.3	+1.83	+ 2.7	−17 12.0	11 46.0	− 5 59.3	−0.9522	0.5208	+0.2121	−15	−90
γ Capricorni	3.8	1.74	3.7	17 3.0	20 38.8	+ 2 37.1	+0.8183	0.5132	0.2229	+73	0
JUPITER	−1.9	. . .	. . .	15 4.1	20 42.0	+ 2 40.2	−1.3071	0.5100	0.2221	−42	−90
44 Capricorni	6.0	1.68	3.1	14 47.6	22 11.4	+ 4 6.9	−1.2722	0.5120	0.2246	−38	−90
45 Capricorni	5.8	1.68	3.3	15 8.6	22 40.0	+ 4 34.6	−0.7868	0.5116	0.2251	− 3	−90
δ Capricorni	3.0	+1.69	+ 3.8	−16 31.0	16 0 10.8	+ 6 2.8	+1.0389	0.5104	+0.2268	+73	+14
μ Capricorni	5.2	1.62	3.4	13 57.4	3 24.8	+ 9 11.1	−0.9913	0.5079	0.2301	−14	−90
ι Aquarii	4.4	1.54	4.2	14 17.2	10 16.1	− 8 9.7	+0.9659	0.5030	0.2364	+76	+ 8
e Aquarii	5.4	1.49	3.7	11 59.2	12 29.9	− 5 59.8	−1.0025	0.5014	0.2383	−14	−90
42 Aquarii	5.5	1.47	4.5	13 15.6	15 46.3	− 2 49.0	+1.1656	0.4994	0.2409	+77	+22
σ Aquarii	4.9	+1.37	+ 4.4	−11 7.0	23 14.6	+ 4 26.6	+0.6523	0.4949	+0.2460	+78	−10
58 Aquarii	6.4	1.37	4.6	11 20.7	23 48.2	+ 4 59.2	+1.0397	0.4946	0.2464	+79	+13
167 G. Aquarii	6.3	1.29	3.9	8 20.6	17 3 28.1	+ 8 33.0	−1.3342	0.4927	0.2486	−40	−90
213 B. Aquarii	6.5	1.27	4.2	8 45.6	6 2.8	+11 3.4	−0.2361	0.4914	0.2500	+30	−57
λ Aquarii	3.8	1.21	4.5	8 2.2	11 20.4	− 7 47.6	+0.3007	0.4891	0.2525	+59	−29
78 Aquarii	6.3	+1.19	+ 4.4	− 7 39.6	12 25.9	− 6 44.0	+0.1647	0.4886	+0.2530	+51	−35
81 Aquarii	6.4	1.16	4.7	7 31.3	16 14.9	− 3 1.1	+0.9812	0.4872	0.2545	+82	+ 8
82 Aquarii	6.4	1.15	4.6	7 2.1	16 53.7	− 2 23.4	+0.6108	0.4869	0.2548	+80	−13
293 B. Aquarii	5.5	1.04	4.2	3 57.8	18 0 15.2	+ 4 46.1	−0.8843	0.4847	0.2570	− 3	−90
316 B. Aquarii	6.5	1.04	4.5	4 23.2	2 54.0	+ 7 20.8	+0.2612	0.4839	0.2576	+58	−31
13 Piscium	6.4	+0.94	+ 4.1	− 1 33.6	9 35.2	−10 8.7	−1.1308	0.4825	+0.2587	−18	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's						At Conjunction in R. A.						Limit-ing Pa allels.	
	Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x′	y′	N.	S.
			s	″	° ′	d	h m	h m				°	°
14	Piscium	5.9	+0.93	+ 4.3	− 1 43.3	18	10 50.1	− 8 55.7	−0.6298	0.4824	+0.2588	+12	−8
21	Piscium	5.6	0.84	4.2	+ 0 36.0		19 37.3	− 0 22.5	−0.9201	0.4814	0.2592	− 4	−8
60 B.	Piscium	6.0	0.82	4.8	− 0 22.1		22 40.8	+ 2 36.2	+0.9430	0.4812	0.2591	+90	+
51	Piscium	5.6	0.60	4.4	+ 6 28.9	19	20 15.4	− 0 23.2	−1.0954	0.4832	0.2547	−16	−
60	Piscium	6.2	0.54	5.0	6 16.4	20	4 47.5	+ 7 55.3	+1.2953	0.4852	0.2512	+90	+3
62	Piscium	6.1	+0.54	+ 4.9	+ 6 49.9		5 17.5	+ 8 24.6	+0.8005	0.4854	+0.2509	+90	−
δ	Piscium	4.6	0.53	4.8	7 7.1		5 30.9	+ 8 37.6	+0.5381	0.4854	0.2508	+77	−1
101	Piscium	6.2	0.33	4.9	14 13.4	21	7 38.2	+10 2.3	−1.0060	0.4960	0.2330	−11	−7
47 B.	Arietis	6.5	0.23	5.5	17 37.3	22	0 39.8	+ 2 34.8	−0.9453	0.5057	0.2155	− 8	−7
20 H¹.	Arietis	6.4	0.24	5.6	16 49.4		1 30.6	+ 3 24.0	+0.1211	0.5062	+0.2145	+51	−3
					NEW	*MOON.*							
154 B.	Aurigæ	6.4	+0.43	+ 9.1	+28 55.9	26	9 36.4	+ 8 0.6	−0.7721	0.5653	−0.0059	− 1	−6
415 B.	Tauri	6.1	0.45	8.9	27 34.3		11 29.8	+ 9 49.8	+0.6774	0.5655	0.0112	+90	+2
49	Aurigæ	5.1	0.59	8.7	28 5.6	27	1 48.8	− 0 23.1	−0.3297	0.5657	0.0511	+25	−3
54	Aurigæ	5.8	+0.61	+ 8.7	+28 20.5		3 37.9	+ 1 22.0	−0.6943	0.5655	−0.0561	+ 4	−6
39	Geminorum	6.2	0.68	8.0	26 11.8		11 45.5	+ 9 11.5	+1.0512	0.5643	0.0784	+90	+37
40	Geminorum	6.3	0.69	7.9	26 2.0		12 2.3	+ 9 27.7	+1.2031	0.5642	0.0791	+90	+5
47	Geminorum	5.6	0.75	7.9	27 0.1		17 3.1	− 9 42.6	−0.2588	0.5630	0.0925	+29	−3
134 B.	Geminorum	6.5	0.78	7.7	26 50.8		19 27.1	− 7 23.8	−0.3248	0.5624	0.0989	+26	−4
A	Geminorum	5.1	+0.80	+ 7.2	+25 13.1		22 12.4	− 4 44.6	+1.1244	0.5616	−0.1060	+90	+4
176 B.	Geminorum	6.3	0.87	6.6	24 33.3	28	4 30.6	+ 1 19.8	+1.1062	0.5595	0.1222	+90	+37
181 B.	Geminorum	6.0	0.87	6.6	24 25.2		4 55.4	+ 1 43.8	+1.1990	0.5594	0.1232	+90	+45
c	Geminorum	5.5	0.90	6.8	25 59.5		7 0.4	+ 3 44.2	−0.7284	0.5586	0.1284	+ 3	−64
κ	Geminorum	3.7	0.89	6.4	24 36.4		7 10.4	+ 3 53.9	+0.7167	0.5585	0.1288	+90	−11
5 B.	Cancri	6.4	+0.97	+ 5.7	+23 49.3		14 20.0	+10 48.1	+0.5602	0.5556	−0.1461	+82	+ 1
4	Cancri	6.2	0.99	6.1	25 19.7		14 37.3	+11 4.7	−1.0733	0.5555	0.1468	−21	−65
9	Cancri	6.2	0.99	5.3	22 53.0		16 38.7	−10 58.2	+1.2059	0.5546	0.1515	+90	+43
35 B.	Cancri	6.4	1.03	5.2	23 23.9		19 51.9	− 7 51.8	+0.1618	0.5531	0.1589	+53	−21
λ	Cancri	5.9	1.08	5.2	24 17.7		22 51.0	− 4 59.0	−1.2663	0.5519	0.1657	−41	−66
γ	Cancri	4.7	+1.17	+ 3.6	+21 46.8	29	8 58.4	+ 4 47.1	−0.4074	0.5471	−0.1871	+22	−54
	Mars	1.6	. . .	. . .	17 45.5	30	0 7.7	− 4 34.7	+0.7368	0.5182	0.2081	+90	+ 7
12 B.	Leonis	6.3	1.33	+ 0.1	16 57.4		4 13.2	− 0 37.4	+0.6732	0.5381	0.2223	+90	− 2
8	Leonis	5.9	1.39	− 0.4	16 49.4		9 32.6	+ 4 31.4	−0.3942	0.5359	0.2306	+23	−5
ν	Leonis	5.0	1.45	2.8	12 51.3		19 29.8	− 9 51.1	+1.3440	0.5321	0.2446	+90	−45
α	Leonis	1.3	+1.49	− 3.4	+12 23.2	31	0 18.5	− 5 11.9	+0.6324	0.5305	−0.2507	+85	− 8
34	Leonis	6.4	1.54	3.1	13 46.8		1 50.0	− 3 43.3	−1.1856	0.5301	0.2525	−24	−76
45	Leonis	5.8	1.58	5.2	10 12.0		9 29.5	+ 3 41.4	+0.5293	0.5281	0.2609	+76	−15
ρ	Leonis	3.8	1.60	5.6	9 44.9		11 57.9	+ 6 5.0	+0.3440	0.5275	0.2632	+63	−24
49	Leonis	5.7	1.60	5.9	9 5.6		13 2.3	+ 7 7.2	+0.7318	0.5273	0.2643	+90	− 4
56	Leonis	6.1	+1.69	− 7.8	+ 6 38.5		23 8.4	− 7 6.0	+0.5224	0.5259	−0.2727	+76	−10

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c	Leonis	5.1	+1.71	− 8.0	+ 6 33.7	1	1 25.1	− 4 53.7	−0.0179	0.5258	−0.2741	+43	−44
80	Leonis	6.4	+1.82	−10.0	+ 4 19.9		13 31.6	+ 6 49.7	−1.1072	0.5258	−0.2804	−16	−56
83	Leonis	6.3	1.80	10.2	3 28.8		14 0.1	+ 7 17.3	−0.3761	0.5258	0.2806	+35	−65
τ	Leonis	5.2	1.82	10.4	3 19.6		14 32.2	+ 7 48.4	−0.3723	0.5259	0.2808	+25	−65
9 B.	Virginis	6.2	1.90	12.4	+ 0 9.4	2	0 41.0	− 6 22.3	−0.0252	0.5274	0.2833	+43	−45
31 B.	Virginis	6.4	1.96	13.3	− 1 17.5		6 24.7	− 0 49.6	−0.1888	0.5288	0.2836	+34	−54
162 B.	Virginis	6.2	+2.08	−15.0	− 4 8.6		19 5.7	+11 26.6	−0.9042	0.5333	−0.2814	− 4	−90
200 B.	Virginis	6.3	2.10	15.3	4 34.9		20 51.8	−10 50.8	−0.9603	0.5341	0.2808	− 8	−90
f	Virginis	6.0	2.13	15.8	5 21.7		23 15.6	− 8 31.7	−0.8490	0.5352	0.2798	− 1	−90
χ	Virginis	4.8	2.12	16.4	7 31.6	3	0 23.9	− 7 25.6	+1.0026	0.5357	0.2792	+82	+10
ψ	Virginis	5.0	2.20	17.2	9 4.6		7 21.4	− 0 42.1	+0.6225	0.5394	0.2753	+78	−12
49	Virginis	5.2	+2.27	−17.8	−10 17.1		13 30.8	+ 5 14.8	+0.1492	0.5431	−0.2706	+50	−50

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
50 Virginis	6.2	+2.28	−17.7	− 9 52.5	3 14 21.4	+ 6 3.7	−0.4879	0.5436	−0.2699	+16	−73
ι Virginis	5.7	2.36	18.5	12 15.9	21 56.0	−10 37.4	−0.1212	0.5486	0.2625	+35	−51
550 B. Virginis	6.0	2.41	18.7	12 46.7	4 1 26.1	− 7 14.6	−0.5216	0.5511	0.2584	+13	−76
83 Virginis	5.6	2.46	19.4	15 45.1	5 42.1	− 3 7.7	+1.3481	0.5543	0.2530	+74	+43
85 Virginis	6.1	2.47	19.4	15 20.5	6 10.8	− 2 40.0	+0.8181	0.5546	0.2524	+75	0
214 G. Virginis	6.5	+2.58	−19.4	−15 55.8	14 35.6	+ 5 26.6	−0.6694	0.5612	−0.2400	+ 3	−90
40 H. Virginis	5.1	2.61	19.3	15 54.1	16 57.8	+ 7 43.6	−1.2613	0.5631	0.2360	−38	−90
43 H. Virginis	5.5	2.64	19.7	17 48.3	18 51.8	+ 9 33.4	+0.1859	0.5647	0.2328	+46	−34
231 G. Virginis	6.4	2.65	19.6	18 11.5	19 33.2	+10 13.3	+0.4097	0.5652	0.2316	+58	−22
236 G. Virginis	5.7	2.66	19.7	18 19.4	20 12.7	+10 51.3	+0.3885	0.5657	0.2304	+56	−24
9 G. Libræ	6.5	+2.76	−19.7	−20 4.1	5 2 53.3	− 6 43.1	+0.6256	0.5712	−0.2177	+68	−10
17 G. Libræ	6.4	2.82	19.6	20 49.0	7 29.5	− 2 17.5	+0.3899	0.5750	0.2081	+54	−23
18 G. Libræ	6.1	2.83	19.6	20 58.2	7 54.6	− 1 53.4	+0.4548	0.5753	0.2072	+57	−20
43 B. Libræ	5.7	2.92	20.0	21 2.1	11 58.6	+ 2 1.2	−0.3054	0.5786	0.1981	+17	−62
47 G. Libræ	6.1	2.94	19.1	21 42.2	15 34.7	+ 5 28.9	−0.3390	0.5814	0.1896	+14	−64
64 G. Libræ	5.8	+2.98	−18.7	−22 5.2	19 29.0	+ 9 13.9	−0.6794	0.5844	−0.1800	− 5	−90
153 B. Libræ	6.3	3.09	18.3	24 12.2	6 1 58.0	− 8 32.7	+0.3131	0.5891	0.1630	+45	−27
169 B. Libræ	6.0	3.09	18.0	22 51.7	3 46.3	− 6 48.8	−1.3116	0.5903	0.1580	−59	−90
42 Libræ	5.0	3.11	17.9	23 32.7	4 42.9	− 5 54.4	−0.7801	0.5910	0.1554	−13	−90
b Scorpii	4.7	3.19	17.6	25 29.7	8 46.1	− 2 1.3	+0.5565	0.5935	0.1438	+57	−13
A Scorpii	4.6	+3.19	−17.4	−25 4.5	9 46.4	− 1 3.4	−0.0047	0.5941	−0.1409	+26	−44
31 B. Scorpii	5.4	3.18	17.3	24 17.0	9 53.5	− 0 56.6	−0.8118	0.5942	0.1406	−16	−90
3 Scorpii	5.9	3.19	17.3	24 59.7	10 10.2	− 0 40.5	−0.1417	0.5944	0.1397	+19	−52
4 Scorpii	5.7	3.22	17.3	26 1.1	10 28.6	− 0 23.0	+0.8357	0.5945	0.1388	+64	+ 4
40 B. Scorpii	5.4	3.20	17.0	24 35.3	11 39.5	+ 0 45.0	−0.7509	0.5952	0.1353	−13	−90
π Scorpii	3.0	+3.22	−17.2	−25 52.3	11 44.7	+ 0 50.0	+0.5169	0.5953	−0.1351	+54	−15
48 B. Scorpii	4.9	3.24	16.9	25 37.9	13 26.6	+ 2 27.7	+0.0514	0.5962	0.1300	+28	−41
50 B. Scorpii	6.4	3.22	16.7	24 29.7	13 40.2	+ 2 40.7	−1.1113	0.5964	0.1293	−38	−90
65 B. Scorpii	5.5	3.27	16.6	26 6.1	15 13.7	+ 4 10.4	+0.2933	0.5971	0.1246	+40	−28
85 B. Scorpii	6.0	3.27	16.2	25 15.8	17 46.6	+ 6 36.9	−0.8502	0.5984	0.1168	−21	−90
σ Scorpii	3.1	+3.30	−15.7	−25 23.5	20 7.5	+ 8 51.9	−0.9888	0.5995	−0.1094	−30	−90
α Scorpii	1.2	3.34	15.3	26 14.8	23 10.2	+11 46.9	−0.4539	0.6006	0.0998	− 1	−74
116 B. Scorpii	6.2	3.36	15.2	26 21.3	23 54.0	−11 31.2	−0.4170	0.6010	0.0974	+ 1	−71
τ Scorpii	2.9	3.40	14.9	28 2.6	7 1 32.6	− 9 56.7	+1.1149	0.6015	0.0921	+62	+27
134 B. Scorpii	6.4	3.41	14.3	27 18.0	4 39.7	− 6 57.5	+0.1002	0.6024	0.0820	+26	−38
135 B. Scorpii	6.0	+3.43	−14.3	−28 21.3	4 54.6	− 6 43.3	+1.1361	0.6025	−0.0811	+62	+29
95 G. Ophiuchi	6.1	3.49	12.2	27 39.6	15 0.5	+ 2 56.9	−0.2087	0.6039	0.0475	+ 7	−57
43 Ophiuchi	5.4	3.52	11.3	28 3.8	19 1.3	+ 6 47.4	+0.0339	0.6039	0.0339	+18	−42
163 G. Ophiuchi	6.3	3.54	9.7	27 50.8	8 2 21.9	−10 10.7	−0.3431	0.6027	0.0090	− 3	−66
X Sagittarii (*var.*)	4.4	3.54	9.3	27 48.1	3 56.4	− 8 40.3	−0.3985	0.6024	0.0037	− 6	−70
4 G. Sagittarii	6.2	+3.51	− 9.3	−26 56.9	4 17.2	− 8 20.3	−1.2622	0.6023	−0.0025	−62	−90
10 G. Sagittarii	5.7	3.55	8.5	28 3.3	7 19.0	− 5 26.2	−0.1366	0.6013	+0.0076	+ 7	−52
210 B. Scorpii	5.8	3.58	8.3	28 45.2	8 1.9	− 4 45.2	+0.5765	0.6011	0.0100	+49	−11
38 B. Sagittarii	4.7	3.57	7.5	28 28.2	11 32.6	− 1 23.3	+0.3463	0.5997	0.0217	+35	−24
C. D.−28° 14268	6.4	3.58	7.1	28 55.4	12 59.2	− 0 0.4	+0.8412	0.5990	0.0265	+61	+ 6
48 G. Sagittarii	6.3	+3.57	− 6.8	−28 19.1	15 1.4	+ 1 56.8	+0.2894	0.5981	+0.0332	+32	−27
62 B. Sagittarii	6.0	3.58	6.6	28 41.0	15 1.5	+ 1 56.9	+0.6600	0.5981	0.0332	+56	− 6
66 B. Sagittarii	4.7	3.52	6.7	27 4.6	15 17.6	+ 2 12.3	−0.9638	0.5980	0.0340	−35	−90
58 G. Sagittarii	6.1	3.57	6.2	28 28.3	16 45.3	+ 3 36.4	+0.5073	0.5971	0.0388	+46	−15
68 G. Sagittarii	6.2	3.51	5.9	26 41.3	18 56.5	+ 5 42.1	−1.2148	0.5960	0.0458	−54	−90
69 G. Sagittarii	6.3	+3.51	− 5.9	−26 48.7	19 4.9	+ 5 50.1	−1.0833	0.5958	+0.0463	−43	−90
86 B. Sagittarii	6.5	3.50	5.8	26 38.3	19 24.2	+ 6 8.6	−1.2437	0.5957	0.0473	−58	−90
φ Sagittarii	3.3	3.50	4.2	27 4.9	9 1 45.0	−11 46.1	−0.4318	0.5916	0.0672	− 2	−72
σ Sagittarii	2.1	3.47	3.5	26 24.3	5 27.7	− 8 12.5	−0.8536	0.5888	0.0785	−24	−90
τ Sagittarii	3.5	3.50	2.3	27 47.9	9 59.2	− 3 51.9	+0.9590	0.5852	0.0918	+62	+13
201 B. Sagittarii	5.9	+3.43	− 1.9	−26 3.1	12 28.9	− 1 28.1	−0.5949	0.5831	+0.0990	− 8	−87

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ψ Sagittarii	4.9	+3.41	− 1.8	−25 24.4	9 13 24.2	− 0 35.0	−1.1671	0.5824	+0.1016	−45	−90
248 B. Sagittarii	5.7	3.43	− 0.2	27 9.7	19 5.6	+ 4 53.0	+1.2646	0.5771	0.1172	+63	+46
51 Sagittarii	5.8	3.34	0.0	24 54.5	21 37.1	+ 7 18.6	−0.7580	0.5747	0.1239	−14	−90
h Sagittarii	4.7	3.35	+ 0.1	25 4.5	21 53.3	+ 7 34.3	−0.5528	0.5744	0.1246	− 3	−82
308 B. Sagittarii	6.3	3.26	1.3	24 9.3	10 5 8.6	− 9 27.0	−0.5364	0.5673	0.1427	0	−80
4 Capricorni	5.7	+3.13	+ 3.1	−22 4.5	15 13.4	+ 0 15.7	−1.1521	0.5569	+0.1654	−36	−90
36 B. Capricorni	6.2	3.10	4.2	22 40.6	20 13.8	+ 5 5.4	+0.3288	0.5516	0.1756	+48	−26
17 Capricorni	5.8	3.01	5.4	21 49.5	11 3 39.9	−11 43.9	+0.7967	0.5439	0.1895	+68	0
20 Capricorni	6.2	2.89	5.9	19 22.1	9 50.6	− 5 45.8	−0.5912	0.5376	0.1999	+ 4	−84
η Capricorni	4.8	2.88	6.5	20 11.6	12 4.0	− 3 36.8	+0.7307	0.5354	0.2034	+70	− 5
114 B. Capricorni	6.1	+2.78	+ 6.6	−17 42.0	17 8.1	+ 1 17.4	−0.8622	0.5304	+0.2109	−10	−90
30 Capricorni	5.4	2.78	7.0	18 20.6	18 28.9	+ 2 35.5	+0.1072	0.5291	0.2127	+41	−38
31 Capricorni	6.3	2.77	6.9	17 49.3	18 38.0	+ 2 44.4	−0.4154	0.5289	0.2130	+14	−69
ι Capricorni	4.3	2.73	7.0	17 12.0	20 33.0	+ 4 35.7	−0.6663	0.5271	0.2156	+ 2	−90
γ Capricorni	3.8	2.64	8.3	17 2.9	12 5 15.4	−10 58.4	+1.0986	0.5191	0.2262	+73	+19
44 Capricorni	6.0	+2.58	+ 7.8	−14 47.5	6 46.2	− 9 30.4	−0.9707	0.5178	+0.2279	−14	−90
45 Capricorni	5.8	2.58	8.0	15 8.5	7 14.2	− 9 3.3	−0.4893	0.5174	0.2284	+13	−74
Jupiter	−2.1	. . .	. . .	14 50.5	7 23.6	− 8 54.2	−0.7761	0.5177	0.2290	− 2	−90
δ Capricorni	3.0	2.60	8.5	16 30.9	8 43.3	− 7 36.9	+1.3212	0.5161	0.2300	+73	+41
μ Capricorni	5.2	2.52	8.3	13 57.3	11 53.6	− 4 32.4	−0.6870	0.5135	0.2332	+ 4	−90
ι Aquarii	4.4	+2.45	+ 9.3	−14 17.1	18 37.4	+ 1 59.4	+1.2588	0.5082	+0.2393	+76	+31
ε Aquarii	5.4	2.38	8.8	11 59.1	20 48.8	+ 4 6.8	−0.6904	0.5066	0.2411	+ 5	−90
σ Aquarii	4.9	2.26	9.7	11 6.9	13 7 22.5	− 9 37.7	+0.9576	0.4994	0.2485	+79	+ 7
58 Aquarii	6.4	2.26	9.9	11 20.6	7 55.6	− 9 5.6	+1.3421	0.4991	0.2488	+79	+40
167 G. Aquarii	6.3	2.18	9.3	8 20.5	11 32.0	− 5 35.3	−1.0109	0.4969	0.2508	−12	−90
213 B. Aquarii	6.5	+2.16	+ 9.7	− 8 45.5	14 4.3	− 3 7.3	+0.0794	0.4955	+0.2521	+46	−40
67 Aquarii	6.4	2.14	9.3	7 24.6	14 10.6	− 3 1.2	−1.3586	0.4954	0.2521	−42	−90
λ Aquarii	3.8	2.10	10.0	8 2.1	19 17.2	+ 1 56.9	+0.6136	0.4928	0.2544	+79	−12
78 Aquarii	6.3	2.08	10.0	7 39.6	20 21.8	+ 2 59.7	+0.4789	0.4923	0.2548	+70	−20
81 Aquarii	6.4	2.04	10.3	7 31.2	14 0 7.6	+ 6 39.2	+1.2900	0.4906	0.2561	+82	+32
263 B. Aquarii	6.1	+2.01	+ 9.4	− 5 10.3	0 12.6	+ 6 44.1	−1.2509	0.4905	+0.2561	−29	−90
82 Aquarii	6.4	2.03	10.2	7 2.0	0 45.9	+ 7 16.5	+0.9224	0.4903	0.2563	+83	+ 5
293 B. Aquarii	5.5	1.92	9.8	3 57.8	8 1.8	− 9 39.5	−0.5628	0.4875	0.2581	+15	−79
316 B. Aquarii	6.5	1.90	10.1	4 23.1	10 38.6	− 7 6.9	+0.5748	0.4867	0.2586	+78	−15
13 Piscium	6.4	1.80	9.7	1 33.5	17 15.5	− 0 40.7	−0.8109	0.4849	0.2594	+ 2	−90
14 Piscium	5.9	+1.79	+ 9.9	− 1 43.2	18 29.6	+ 0 31.4	−0.3134	0.4846	+0.2595	+28	−61
21 Piscium	5.6	1.69	9.7	+ 0 36.1	15 3 11.8	+ 8 59.7	−0.6072	0.4831	0.2594	+13	−82
25 Piscium	6.2	1.66	9.5	+ 1 36.9	5 15.5	+11 0.2	−1.1892	0.4829	0.2592	−23	−88
60 B. Piscium	6.0	1.67	10.3	− 0 22.0	6 13.8	+11 56.9	+1.2444	0.4828	0.2591	+90	+27
51 Piscium	5.6	1.42	9.4	+ 6 29.0	16 3 40.2	+ 8 49.3	−0.8066	0.4836	0.2537	+ 2	−71
62 Piscium	6.1	+1.35	+ 9.8	+ 6 50.0	12 40.0	− 6 25.2	+1.0710	0.4854	+0.2496	+90	+16
δ Piscium	4.6	1.34	9.6	7 7.2	12 53.3	− 6 12.3	+0.8090	0.4854	0.2495	+90	0
101 Piscium	6.2	1.10	8.7	14 13.5	17 14 56.8	− 4 51.5	−0.7754	0.4953	0.2310	+ 3	−71
47 B. Arietis	6.5	0.96	8.4	17 37.4	18 7 57.0	+11 39.6	−0.7492	0.5050	0.2133	+ 4	−71
20 H^1. Arietis	6.4	0.96	8.6	16 49.4	8 47.8	−11 31.1	+0.3136	0.5054	0.2123	+62	−21
26 Arietis	6.2	+0.88	+ 8.4	+19 28.6	19 41.8	− 0 56.4	−0.3765	0.5128	+0.1981	+24	−54
μ Arietis	5.7	0.85	8.6	19 38.9	19 1 35.8	+ 4 46.9	+0.5782	0.5170	0.1896	+82	− 4
47 Arietis	5.8	0.82	8.7	20 19.6	9 20.4	−11 43.0	+1.2508	0.5227	0.1774	+90	+43
ε Arietis (*mean*)	4.6	0.80	8.6	21 0.0	9 53.6	−11 10.8	+0.6089	0.5231	0.1764	+86	− 1
64 Arietis	5.8	0.74	8.2	24 25.3	21 52.9	+ 0 25.6	−1.1594	0.5322	0.1551	−28	−66
66 Arietis	6.1	+0.74	+ 8.6	+22 30.6	23 51.4	+ 2 20.2	+1.2390	0.5336	+0.1513	+90	+46
7 Tauri	5.9	0.72	8.3	24 10.7	20 2 38.2	+ 5 1.5	−0.1760	0.5357	0.1459	+34	−37
11 Tauri	6.1	0.71	8.1	25 3.3	5 33.5	+ 7 51.1	−0.7162	0.5380	0.1400	+ 4	−65
16 Tauri	5.4	0.71	8.5	24 1.3	7 25.9	+ 9 39.7	+0.6717	0.5393	0.1361	+90	+ 7
17 Tauri	3.8	0.71	8.5	23 50.8	7 28.0	+ 9 41.7	+0.8690	0.5394	0.1360	+90	+10
18 Tauri	5.6	+0.70	+ 8.4	+24 34.4	7 35.3	+ 9 48.8	+0.0909	0.5394	+0.1358	+49	−22

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's						At Conjunction in R. A.						Limiting Parallels.	
	Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x′	y′	N.	S.
			Δα	Δδ									
			s	″	° ′	d	h m	h m				°	°
q	Tauri	4.3	+0.71	+ 8.4	+24 12.0	**20**	7 36.9	+ 9 50.4	+0.5012	0.5395	+0.1357	+77	− 2
20	Tauri	4.1	0.71	8.5	24 6.1		7 54.0	+10 6.9	+0.6476	0.5397	0.1351	+90	+ 6
21	Tauri	5.8	0.70	8.4	24 17.4		7 56.1	+10 8.9	+0.4478	0.5397	0.1350	+73	− 4
22	Tauri	6.5	0.70	8.4	24 15.8		8 0.0	+10 12.7	+0.4854	0.5398	0.1349	+76	− 2
23	Tauri	4.3	0.71	8.5	23 41.0		8 8.2	+10 20.6	+1.1370	0.5398	0.1346	+90	+38
η	Tauri	3.0	+0.70	+ 8.5	+23 50.5		8 39.9	+10 51.2	+1.0341	0.5403	+0.1335	+90	+30
27	Tauri	3.7	0.70	8.5	23 47.6		9 26.0	+11 35.7	+1.1892	0.5408	0.1319	+90	+43
28	Tauri	5.2	0.70	8.5	23 52.6		9 26.6	+11 36.3	+1.0992	0.5408	0.1319	+90	+35
14 H.	Tauri	5.3	0.70	8.2	25 19.4		9 56.2	−11 55.1	−0.4162	0.5412	0.1308	+21	−49
p	Tauri	5.6	0.67	8.3	26 15.6		19 11.0	− 2 59.1	−0.3210	0.5478	+0.1103	+26	−41
					NEW	*MOON.*							
9	Cancri	6.2	+0.94	+ 4.9	+22 53.0	**24**	22 37.9	− 3 11.6	+1.0400	0.5593	−0.1547	+90	+29
35 B.	Cancri	6.4	0.97	4.7	23 23.9	**25**	1 48.6	− 0 7.7	−0.0048	0.5577	0.1621	+44	−29
39	Cancri	6.5	1.02	3.2	20 18.8		13 22.7	+11 1.7	+1.1962	0.5519	0.1873	+90	+38
40	Cancri	6.5	+1.02	+ 3.2	+20 16.6		13 25.0	+11 3.9	+1.2271	0.5518	−0.1874	+90	+41
γ	Cancri	4.7	1.05	3.4	21 46.8		14 46.0	−11 37.9	−0.5964	0.5512	0.1902	+12	−64
	Venus	−3.4	. . .	. . .	20 12.7		16 0.2	−10 26.3	+0.8042	0.5019	0.1796	+90	+ 9
12 B.	Leonis	6.3	1.16	0.7	16 57.4	**26**	9 50.4	+ 6 47.1	+0.4475	0.5411	0.2249	+71	−14
8	Leonis	5.9	1.20	+ 0.2	16 49.4		15 7.8	+11 53.9	−0.6253	0.5385	0.2331	+11	−71
ψ	Leonis	5.6	+1.20	− 0.7	+14 24.9		18 15.1	− 9 5.1	+1.1309	0.5370	−0.2376	+90	+25
ν	Leonis	5.0	1.24	1.8	12 51.3	**27**	1 2.2	− 2 31.3	+1.0970	0.5339	0.2466	+90	+21
α	Leonis	1.3	1.28	2.4	12 23.2		5 50.1	+ 2 7.2	+0.3806	0.5320	0.2524	+66	−21
	Mars	1.7	. . .	. . .	12 7.3		10 50.1	+ 6 57.4	−0.6218	0.5075	0.2487	+11	−76
45	Leonis	5.8	1.35	4.0	10 12.0		15 0.7	+11 0.0	+0.2684	0.5286	0.2620	+59	−28
ρ	Leonis	3.8	+1.36	− 4.3	+ 9 44.9		17 29.3	−10 36.2	+0.0807	0.5279	−0.2642	+48	−37
49	Leonis	5.7	1.37	4.7	9 5.6		18 33.8	− 9 33.7	+0.4683	0.5276	0.2651	+72	−18
37	Sextantis	6.3	1.40	5.8	6 49.5		23 53.8	− 4 24.0	+1.3679	0.5262	0.2694	+90	+44
56	Leonis	6.1	1.44	6.4	6 38.6	**28**	4 41.9	+ 0 14.9	+0.2519	0.5251	0.2726	+58	−30
c	Leonis	5.1	1.46	6.6	6 33.7		6 59.3	+ 2 27.9	−0.2912	0.5248	0.2740	+29	−59
79	Leonis	5.5	+1.54	− 9.1	+ 1 52.6		18 19.2	−10 33.7	+1.3558	0.5236	−0.2791	+90	+39
80	Leonis	6.4	1.57	8.4	4 19.9		19 11.4	− 9 43.1	−1.3901	0.5236	0.2794	−44	−86
83	Leonis	6.3	1.54	8.6	3 28.8		19 40.2	− 9 15.2	−0.6554	0.5236	0.2795	+11	−85
τ	Leonis	5.2	1.57	8.8	3 19.7		20 12.7	− 8 43.7	−0.6517	0.5236	0.2797	+11	−85
9 B.	Virginis	6.2	1.65	10.7	+ 0 9.4	**29**	6 28.6	+ 1 12.7	−0.3023	0.5241	0.2813	+28	−61
31 B.	Virginis	6.4	+1.72	−11.8	− 1 17.4		12 17.2	+ 6 50.2	−0.4654	0.5249	−0.2812	+20	−71
162 B.	Virginis	6.2	1.84	13.6	4 8.6	**30**	1 11.2	− 4 40.4	−1.1803	0.5282	0.2781	−23	−90
200 B.	Virginis	6.3	1.86	13.8	4 34.9		2 59.3	− 2 55.8	−1.2358	0.5288	0.2773	−28	−90
f	Virginis	6.0	1.89	14.2	5 21.7		5 25.9	− 0 33.9	−1.1216	0.5297	0.2762	−19	−90
χ	Virginis	4.8	1.89	15.1	7 31.6		6 35.6	+ 0 33.6	+0.7499	0.5302	0.2756	+80	− 5
ψ	Virginis	5.0	+1.98	−16.0	− 9 4.6		13 42.0	+ 7 26.1	+0.3737	0.5332	−0.2712	+63	−25
49	Virginis	5.2	2.06	16.6	10 17.1		19 59.8	−10 28.6	−0.0969	0.5364	0.2662	+36	−49
50	Virginis	6.2	+2.07	−16.5	− 9 52.5		20 51.5	− 9 38.7	−0.7404	0.5369	−0.2655	+ 3	−90

JULY.

	Name.	Mag.	Δα	Δδ	Apparent Declination.	d	h m	Hour Angle, H	Y	x′	y′	N.	S.
i	Virginis	5.7	+2.17	−17.6	−12 15.9	**1**	4 37.2	− 2 8.6	−0.3585	0.5414	−0.2578	+22	−65
550 B.	Virginis	6.0	2.22	17.8	12 46.7		8 12.6	+ 1 19.4	−0.7585	0.5437	0.2536	0	−90
83	Virginis	5.6	2.29	18.8	15 45.1		12 35.2	+ 5 33.0	+1.1424	0.5466	0.2481	+74	+21
85	Virginis	6.1	2.29	18.7	15 20.5		13 4.6	+ 6 1.3	+0.6064	0.5470	0.2475	+72	−12
214 G.	Virginis	6.5	+2.43	−18.8	−15 55.8		21 42.9	− 9 38.5	−0.8853	0.5532	−0.2349	−10	−90
43 H.	Virginis	5.5	2.51	19.3	17 48.3	**2**	2 6.0	− 5 24.8	−0.0104	0.5564	0.2277	+36	−45
231 G.	Virginis	6.4	2.52	19.3	18 11.5		2 48.5	− 4 43.7	+0.2178	0.5570	0.2265	+47	−32
236 G.	Virginis	5.7	2.53	19.4	18 19.4		3 29.1	− 4 4.6	+0.1977	0.5576	0.2253	+46	−33
9 G.	Libræ	6.5	2.65	19.7	20 4.1		10 20.7	+ 2 32.0	+0.4516	0.5628	0.2127	+58	−20
17 G.	Libræ	6.4	+2.73	−19.8	−20 49.0		15 4.5	+ 7 5.3	+0.2226	0.5666	−0.2032	+45	−32

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
18 G. Libræ	6.1	+2.74	−19.7	−20 58.2	2 15 30.3	+ 7 30.0	+0.2892	0.5669	−0.2023	+48	−28
43 B. Libræ	5.7	2.85	20.3	21 2.1	19 40.9	+11 31.2	−0.4725	0.5702	0.1933	+ 8	−74
47 G. Libræ	6.1	2.89	19.4	21 42.2	23 22.8	− 8 55.3	−0.4986	0.5731	0.1849	+ 6	−76
64 G. Libræ	5.8	2.95	19.1	22 5.2	3 3 23.5	− 5 3.8	−0.8347	0.5761	0.1754	−14	−90
153 B. Libræ	6.3	3.09	19.0	24 12.2	10 2.8	+ 1 19.8	+0.1856	0.5810	0.1586	+38	−34
42 Libræ	5.0	+3.13	−18.4	−23 32.7	12 51.9	+ 4 2.3	−0.9153	0.5829	−0.1512	−21	−90
b Scorpii	4.7	3.23	18.4	25 29.7	17 1.4	+ 8 1.8	+0.4475	0.5856	0.1398	+50	−19
A Scorpii	4.6	3.24	18.1	25 4.6	18 3.1	+ 9 1.1	−0.1183	0.5863	0.1369	+20	−51
31 B. Scorpii	5.4	3.23	17.9	24 17.0	18 10.4	+ 9 8.1	−0.9353	0.5864	0.1366	−24	−90
3 Scorpii	5.9	3.24	18.0	24 59.7	18 27.6	+ 9 24.6	−0.2561	0.5866	0.1358	+13	−59
4 Scorpii	5.7	+3.27	−18.2	−26 1.1	18 46.4	+ 9 42.6	+0.7340	0.5868	−0.1349	+64	− 3
40 B. Scorpii	5.4	3.26	17.7	24 35.3	19 59.1	+10 52.4	−0.8693	0.5876	0.1314	−20	−90
π Scorpii	3.0	3.29	18.0	25 52.3	20 4.4	+10 57.5	+0.4142	0.5876	0.1312	+48	−21
48 B. Scorpii	4.9	3.31	17.7	25 37.9	21 48.8	−11 22.3	−0.0531	0.5886	0.1262	+22	−47
50 B. Scorpii	6.4	3.30	17.4	24 29.7	22 2.7	−11 9.0	−1.2293	0.5887	0.1255	−49	−90
65 B. Scorpii	5.5	+3.36	−17.5	−26 6.1	23 38.5	− 9 37.0	+0.1958	0.5896	−0.1208	+35	−33
85 B. Scorpii	6.0	3.37	16.9	25 15.8	4 2 15.0	− 7 6.8	−0.9552	0.5910	0.1131	−29	−90
σ Scorpii	3.1	3.41	16.5	25 23.5	4 39.2	− 4 48.5	−1.0896	0.5923	0.1059	−38	−90
α Scorpii	1.2	3.48	16.2	26 14.8	7 46.0	− 1 49.4	−0.5413	0.5937	0.0964	− 5	−82
116 B. Scorpii	6.2	3.49	16.1	26 21.3	8 30.8	− 1 6.5	−0.5023	0.5940	0.0940	− 4	−78
τ Scorpii	2.9	+3.56	−16.1	−28 2.6	10 11.5	+ 0 30.1	+1.0502	0.5947	−0.0888	+62	+21
134 B. Scorpii	6.4	3.58	15.3	27 18.0	13 22.7	+ 3 33.4	+0.0316	0.5958	0.0788	+22	−42
135 B. Scorpii	6.0	3.61	15.5	28 21.3	13 37.9	+ 3 47.9	+1.0791	0.5959	0.0780	+62	+24
95 G. Ophiuchi	6.1	3.73	13.2	27 39.6	23 55.7	−10 20.0	−0.2561	0.5983	0.0447	+ 5	−60
43 Ophiuchi	5.4	3.79	12.3	28 3.8	5 4 0.8	− 6 25.1	−0.0018	0.5986	0.0313	+17	−44
163 G. Ophiuchi	6.3	+3.86	−10.5	−27 50.8	11 28.5	+ 0 43.9	−0.3647	0.5983	−0.0067	− 4	−67
X Sagittarii (*var.*)	4.4	3.88	10.1	27 48.1	13 4.5	+ 2 15.8	−0.4168	0.5981	−0.0014	− 7	−72
10 G. Sagittarii	5.7	3.92	9.2	28 3.3	16 29.9	+ 5 32.7	−0.1450	0.5975	+0.0099	+ 7	−53
210 B. Scorpii	5.8	3.94	9.1	28 45.2	17 13.4	+ 6 14.3	+0.5747	0.5973	0.0123	+49	−11
38 B. Sagittarii	4.7	3.96	8.2	28 28.2	20 46.7	+ 9 38.8	+0.3508	0.5963	0.0239	+35	−24
C. D.−28° 14268	6.4	+3.98	− 7.9	−28 55.4	22 14.4	+11 2.9	+0.8521	0.5958	+0.0286	+61	+ 6
48 G. Sagittarii	6.3	3.98	7.4	28 19.1	6 0 17.9	−10 58.8	+0.3014	0.5951	0.0352	+33	−27
62 B. Sagittarii	6.0	3.99	7.3	28 41.0	0 18.1	−10 58.6	+0.6743	0.5951	0.0353	+58	− 5
66 B. Sagittarii	4.7	3.94	7.1	27 4.6	0 34.4	−10 42.9	−0.9585	0.5950	0.0361	−35	−90
58 G. Sagittarii	6.1	4.00	6.8	28 28.3	2 3.0	− 9 18.0	+0.5246	0.5944	0.0409	+48	−14
68 G. Sagittarii	6.2	+3.95	− 6.1	−26 41.3	4 15.5	− 7 10.9	−1.2019	0.5934	+0.0479	−53	−90
69 G. Sagittarii	6.3	3.95	6.1	26 48.7	4 24.0	− 7 2.8	−1.0694	0.5933	0.0484	−42	−90
86 B. Sagittarii	6.5	3.95	6.0	26 38.3	4 43.5	− 6 44.1	−1.2297	0.5932	0.0494	−56	−90
φ Sagittarii	3.3	3.99	4.4	27 4.9	11 7.7	− 0 35.6	−0.3985	0.5898	0.0693	0	−70
σ Sagittarii	2.1	3.98	3.4	26 24.3	14 51.9	+ 2 59.6	−0.8132	0.5875	0.0806	−22	−90
τ Sagittarii	3.5	+4.04	− 2.3	−27 47.9	19 25.0	+ 7 21.9	+1.0161	0.5843	+0.0939	+62	+18
201 B. Sagittarii	5.9	3.98	1.5	26 3.1	21 55.4	+ 9 46.3	−0.5368	0.5825	0.1011	− 4	−81
ψ Sagittarii	4.9	3.96	− 1.3	25 24.4	22 50.9	+10 39.7	−1.1084	0.5818	0.1037	−40	−90
51 Sagittarii	5.8	3.94	+ 0.8	24 54.5	7 7 5.1	− 5 25.3	−0.6787	0.5751	0.1261	− 9	−90
h Sagittarii	4.7	3.95	0.9	25 4.4	7 21.4	− 5 9.6	−0.4725	0.5749	0.1268	+ 1	−75
308 B. Sagittarii	6.3	+3.90	+ 2.5	−24 9.3	14 36.8	+ 1 49.3	−0.4393	0.5684	+0.1451	+ 5	−72
329 B. Sagittarii	6.1	3.86	3.4	22 58.4	17 35.6	+ 4 41.4	−1.2255	0.5656	0.1521	−45	−90
336 B. Sagittarii	6.5	3.85	3.6	22 50.2	18 35.0	+ 5 38.7	−1.2172	0.5647	0.1544	−44	−90
4 Capricorni	5.7	3.81	4.9	22 4.5	8 0 40.4	+11 30.7	−1.0316	0.5589	0.1680	−27	−90
36 B. Capricorni	6.2	3.80	6.1	22 40.5	5 39.4	− 7 41.0	+0.4587	0.5540	0.1783	+55	−19
17 Capricorni	5.8	+3.74	+ 7.7	−21 49.5	13 3.0	− 0 32.9	+0.9411	0.5468	+0.1923	+68	+ 9
20 Capricorni	6.2	3.63	8.6	19 22.0	19 11.1	+ 5 22.7	−0.4306	0.5408	0.2029	+13	−71
η Capricorni	4.8	3.64	9.2	20 11.6	21 23.5	+ 7 30.6	+0.8920	0.5387	0.2064	+70	+ 5
114 B. Capricorni	6.1	3.53	9.8	17 41.9	9 2 24.9	−11 37.9	−0.6858	0.5340	0.2140	0	−90
30 Capricorni	5.4	3.54	10.2	18 20.6	3 45.0	−10 20.4	+0.2829	0.5327	0.2159	+51	−29
31 Capricorni	6.3	+3.53	+10.1	−17 49.2	3 54.0	−10 11.7	−0.2376	0.5325	+0.2161	+24	−58

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$									
		s	"	° ′	d	h m	h m				°	°
ι Capricorni	4.3	+3.50	+10.4	-17 11.9	9	5 47.9	- 8 21.4	-0.4839	0.5308	+0.2187	+12	-74
Jupiter	-2.3	. . .	. . .	15 22.0		14 6.3	- 0 19.0	-0.5694	0.5273	0.2306	+ 9	-81
γ Capricorni	3.8	3.44	11.8	17 2.9		14 24.9	- 0 0.9	+1.2902	0.5231	0.2295	+73	+36
42 Capricorni	5.1	3.36	11.3	14 25.7		15 10.3	+ 0 43.1	-1.3234	0.5225	0.2303	-44	-90
44 Capricorni	6.0	3.36	11.7	14 47.4		15 54.7	+ 1 26.1	-0.7677	0.5218	0.2312	- 1	-90
45 Capricorni	5.8	+3.37	+11.8	-15 8.4		16 22.5	+ 1 53.0	-0.2874	0.5214	+0.2317	+24	-60
μ Capricorni	5.2	3.32	12.3	13 57.2		20 58.7	+ 6 20.6	-0.4761	0.5176	0.2365	+15	-73
ε Aquarii	5.4	3.20	13.2	11 59.1	10	5 47.4	- 9 6.6	-0.4647	0.5108	0.2444	+17	-72
σ Aquarii	4.9	3.09	14.4	11 6.9		16 13.2	+ 1 0.9	+1.1902	0.5036	0.2516	+79	+24
167 G. Aquarii	6.3	3.01	14.3	8 20.4		20 19.6	+ 5 0.1	-0.7628	0.5010	0.2539	+ 3	-90
213 B. Aquarii	6.5	+2.99	+14.7	- 8 45.5		22 49.9	+ 7 26.2	+0.3250	0.4995	+0.2551	+60	-27
67 Aquarii	6.4	2.97	14.3	7 24.6		22 56.2	+ 7 32.3	-1.1053	0.4995	0.2552	-18	-90
λ Aquarii	3.8	2.94	15.1	8 2.0	11	3 58.9	-11 33.5	+0.8626	0.4968	0.2573	+82	+ 1
78 Aquarii	6.3	2.92	15.1	7 39.5		5 2.6	-10 31.6	+0.7296	0.4963	0.2577	+81	- 6
263 B. Aquarii	6.1	2.85	14.8	5 10.2		8 50.6	- 6 49.9	-0.9873	0.4944	0.2589	-10	-90
82 Aquarii	6.4	+2.87	+15.4	- 7 1.9		9 23.4	- 6 18.1	+1.1754	0.4941	+0.2591	+83	+22
293 B. Aquarii	5.5	2.77	15.2	3 57.7		16 34.0	+ 0 40.6	-0.2957	0.4911	0.2607	+29	-60
316 B. Aquarii	6.5	2.76	15.6	4 23.0		19 9.0	+ 3 11.3	+0.8384	0.4902	0.2611	+86	0
13 Piscium	6.4	2.66	15.3	1 33.4	12	1 41.3	+ 9 33.0	-0.5361	0.4881	0.2616	+17	-76
14 Piscium	5.9	2.66	15.5	- 1 43.1		2 54.6	+10 44.3	-0.0402	0.4878	0.2616	+42	-46
21 Piscium	5.6	+2.56	+15.4	+ 0 36.2		11 31.2	- 4 53.0	-0.3289	0.4859	+0.2612	+27	-62
25 Piscium	6.2	2.53	15.2	1 37.0		13 33.7	- 2 53.8	-0.9077	0.4856	0.2609	- 4	-88
51 Piscium	5.6	2.31	15.1	6 29.1	13	11 47.2	- 5 16.0	-0.5266	0.4851	0.2544	+17	-74
62 Piscium	6.1	2.24	15.4	6 50.1		20 43.8	+ 3 26.2	+1.3432	0.4864	0.2498	+90	+40
δ Piscium	4.6	2.23	15.2	7 7.3		20 57.0	+ 3 39.0	+1.0819	0.4864	0.2497	+90	+16
101 Piscium	6.2	+1.99	+13.7	+14 13.6	14	22 55.8	+ 4 55.3	-0.5174	0.4949	+0.2301	+17	-68
35 B. Arietis	6.4	1.87	12.7	17 50.6	15	13 48.4	- 4 37.5	-1.2069	0.5025	0.2144	-28	-72
47 B. Arietis	6.5	1.85	12.8	17 37.4		15 56.0	- 2 33.7	-0.5101	0.5037	0.2118	+17	-64
20 H¹. Arietis	6.4	1.85	13.0	16 49.5		16 46.8	- 1 44.3	+0.5513	0.5042	0.2108	+79	- 9
26 Arietis	6.2	1.77	12.4	19 28.7	16	3 42.0	+ 8 51.6	-0.1527	0.5111	0.1964	+36	-42
μ Arietis	5.7	+1.72	+12.3	+19 38.9		9 36.7	- 9 24.4	+0.7938	0.5151	+0.1878	+90	+ 8
ε Arietis (*mean*)	4.6	1.66	11.9	21 0.0		17 55.9	- 1 20.7	+0.8122	0.5210	0.1745	+90	+10
64 Arietis	5.8	1.59	10.7	24 25.4	17	5 57.4	+10 17.8	-0.9753	0.5300	0.1531	-13	-65
7 Tauri	5.9	1.56	10.7	24 10.8		10 43.6	- 9 5.3	+0.0006	0.5336	0.1439	+44	-28
11 Tauri	6.1	1.54	10.4	25 3.3		13 39.4	- 6 15.4	-0.5446	0.5358	0.1380	+14	-57
16 Tauri	5.4	+1.53	+10.7	+24 1.4		15 32.1	- 4 26.3	+0.8403	0.5372	+0.1341	+90	+17
17 Tauri	3.8	1.53	10.7	23 50.8		15 34.3	- 4 24.2	+1.0375	0.5372	0.1340	+90	+31
18 Tauri	5.6	1.53	10.5	24 34.4		15 41.5	- 4 17.3	+0.2592	0.5373	0.1338	+60	-14
q Tauri	4.3	1.53	10.6	24 12.1		15 43.1	- 4 15.7	+0.6694	0.5373	0.1337	+90	+ 8
20 Tauri	4.1	1.52	10.6	24 6.2		16 0.3	- 3 59.1	+0.8153	0.5375	0.1331	+90	+16
21 Tauri	5.8	+1.53	+10.6	+24 17.4		16 2.4	- 3 57.1	+0.6154	0.5376	+0.1330	+88	+ 5
22 Tauri	6.5	1.52	10.6	24 15.8		16 6.3	- 3 53.3	+0.6530	0.5376	0.1329	+90	+ 7
23 Tauri	4.3	1.52	10.8	23 41.0		16 14.5	- 3 45.3	+1.3044	0.5377	0.1326	+90	+59
η Tauri	3.0	1.52	10.7	23 50.6		16 46.3	- 3 14.7	+1.2006	0.5381	0.1315	+90	+44
28 Tauri	5.2	1.52	10.7	23 52.7		17 33.2	- 2 29.3	+1.2643	0.5387	0.1299	+90	+52
14 H. Tauri	5.3	+1.52	+10.2	+25 19.4		18 2.8	- 2 0.7	-0.2520	0.5390	+0.1288	+30	-39
p Tauri	5.6	1.46	9.8	26 15.6	18	3 19.0	+ 6 56.5	-0.1726	0.5458	0.1083	+34	-33
φ Tauri	5.0	1.44	9.4	27 8.9		7 32.2	+11 0.9	-0.7020	0.5488	0.0985	+ 4	-63
χ Tauri	5.3	1.43	9.9	25 25.8		8 32.9	+11 59.5	+1.2646	0.5495	0.0961	+90	+56
17 B. Aurigæ	6.0	1.38	8.9	27 45.4		21 38.7	+ 0 37.5	-0.2133	0.5578	0.0634	+32	-31
38 B. Aurigæ	6.5	+1.35	+ 8.7	+27 34.7	19	2 42.4	+ 5 30.1	+0.2663	0.5606	+0.0501	+61	- 5
47 B. Aurigæ	6.0	1.34	8.6	27 55.5		4 52.2	+ 7 35.2	-0.0048	0.5617	0.0444	+44	-18
354 B. Tauri	6.4	1.32	8.4	27 52.4		9 36.9	-11 50.5	+0.2308	0.5640	0.0315	+58	- 5
22 Aurigæ	6.4	1.32	8.1	28 51.5		10 36.0	-10 53.7	-0.7980	0.5644	0.0288	- 3	-61
β Tauri	1.8	1.32	8.0	28 32.3		11 49.6	- 9 42.8	-0.4207	0.5650	0.0254	+20	-40
107 B. Aurigæ	6.5	+1.29	+ 8.1	+27 36.6		15 52.2	- 5 49.1	+0.6560	0.5666	+0.0142	+90	+19

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
116 B. Aurigæ	5.9	+1.30	+ 7.8	+29 10.1	**19** 17 14.8	− 4 29.7	−0.9989	0.5671	+0.0103	−18	−61
406 B. Tauri	5.6	1.27	7.7	27 56.7	22 6.5	+ 0 11.1	+0.3280	0.5687	−0.0035	+65	+ 2
136 Tauri	4.6	1.27	7.7	27 35.7	23 5.5	+ 1 8.0	+0.6974	0.5690	0.0063	+90	+22
154 B. Aurigæ	6.4	1.27	7.4	28 55.9	**20** 0 24.3	+ 2 23.8	−0.7414	0.5693	0.0100	+ 1	−61
415 B. Tauri	6.1	1.26	+ 7.6	27 34.3	2 15.9	+ 4 11.2	+0.6878	0.5698	0.0153	+90	+20
				NEW	*MOON.*						
α Leonis	1.3	+1.22	− 2.0	+12 23.2	**24** 12 23.4	+10 27.9	+0.2446	0.5379	−0.2567	+58	−28
44 Leonis	5.9	1.24	3.4	9 13.3	20 16.3	− 5 54.8	+1.4137	0.5348	0.2651	+90	+57
45 Leonis	5.8	1.26	3.2	10 12.0	21 23.4	− 4 49.9	+0.1195	0.5344	0.2662	+50	−35
ρ Leonis	3.8	+1.26	− 3.6	+ 9 44.9	23 49.2	− 2 28.9	−0.0701	0.5336	−0.2684	+41	−46
49 Leonis	5.7	1.26	3.9	9 5.6	**25** 0 52.4	− 1 27.8	+0.3127	0.5333	0.2693	+62	−20
37 Sextantis	6.3	1.27	4.9	6 49.5	6 6.6	+ 3 36.2	+1.1980	0.5317	0.2734	+90	+26
56 Leonis	6.1	1.30	5.3	6 38.6	10 49.6	+ 8 10.0	+0.0851	0.5305	0.2766	+49	−39
c Leonis	5.1	1.31	5.6	6 33.7	13 4.6	+10 20.6	−0.4566	0.5300	0.2779	+21	−69
79 Leonis	5.5	+1.35	− 7.7	+ 1 52.7	**26** 0 13.6	− 2 51.8	+1.1671	0.5282	−0.2825	+90	+21
83 Leonis	6.3	1.35	7.3	3 28.8	1 33.4	− 1 34.5	−0.8324	0.5281	0.2829	+ 1	−87
τ Leonis	5.2	1.38	7.6	3 19.7	2 5.4	− 1 3.6	−c.8292	0.5280	0.2830	+ 1	−87
9 B. Virginis	6.2	1.43	9.2	+ 0 9.4	12 13.0	+ 8 44.5	−0.4908	0.5278	0.2840	+19	−73
31 B. Virginis	6.4	1.48	10.2	− 1 17.4	17 57.6	− 9 41.9	−0.6571	0.5281	0.2836	+10	−87
162 B. Virginis	6.2	+1.59	−11.9	− 4 8.6	**27** 6 44.7	+ 2 40.4	−1.3766	0.5302	−0.2795	−43	−90
200 B. Virginis	6.3	1.61	12.2	4 34.9	8 32.1	+ 4 24.4	−1.4326	0.5306	0.2787	−57	−90
f Virginis	6.0	1.63	12.6	5 21.7	10 57.8	+ 6 45.3	−1.3196	0.5313	0.2773	−36	−90
χ Virginis	4.8	1.63	13.4	7 31.6	12 7.2	+ 7 52.5	+0.5479	0.5316	0.2766	+75	−16
ψ Virginis	5.0	1.71	14.3	9 4.6	19 11.9	− 9 16.7	+0.1723	0.5340	0.2717	+51	−35
49 Virginis	5.2	+1.78	−15.0	−10 17.1	**28** 1 29.0	− 3 12.1	−0.2976	0.5365	−0.2663	+26	−62
50 Virginis	6.2	1.80	14.9	9 52.5	2 20.7	− 2 22.1	−0.9411	0.5369	0.2655	− 8	−90
i Virginis	5.7	1.89	16.0	12 15.9	10 6.8	+ 5 8.4	−0.5575	0.5406	0.2572	+12	−79
550 B. Virginis	6.0	1.94	16.3	12 46.7	13 42.9	+ 8 37.1	−0.9573	0.5424	0.2529	−11	−90
83 Virginis	5.6	2.00	17.4	15 45.1	18 6.6	−11 8.2	+0.9504	0.5449	0.2471	+74	+ 7
85 Virginis	6.1	+2.01	−17.3	−15 20.4	18 36.2	−10 39.6	+0.4131	0.5451	−0.2464	+61	−23
214 G. Virginis	6.5	2.15	17.6	15 55.8	**29** 3 17.9	− 2 16.2	−1.0788	0.5504	0.2333	−22	−90
43 H. Virginis	5.5	2.22	18.2	17 48.3	7 43.4	+ 2 0.0	−0.1971	0.5532	0.2259	+26	−55
231 G. Virginis	6.4	2.24	18.3	18 11.5	8 26.4	+ 2 41.5	+0.0327	0.5537	0.2246	+37	−42
236 G. Virginis	5.7	2.25	18.4	18 19.4	9 7.4	+ 3 21.0	+0.0130	0.5541	0.2235	+36	−43
9 G. Libræ	6.5	+2.38	−18.8	−20 4.1	16 3.5	+10 2.1	+0.2743	0.5587	−0.2105	+48	−29
17 G. Libræ	6.4	2.46	19.0	20 49.0	20 51.0	− 9 20.9	+0.0482	0.5620	0.2008	+35	−41
18 G. Libræ	6.1	2.47	19.0	20 58.2	21 17.2	− 8 55.7	+0.1158	0.5623	0.1999	+39	−38
43 B. Libræ	5.7	2.60	19.9	21 2.1	**30** 1 31.4	− 4 50.9	−0.6470	0.5651	0.1908	− 1	−90
47 G. Libræ	6.1	2.63	18.8	21 42.2	5 16.8	− 1 13.8	−0.6697	0.5676	0.1824	− 3	−90
64 G. Libræ	5.8	+2.71	−18.7	−22 5.2	9 21.4	+ 2 41.5	−1.0045	0.5704	−0.1727	−25	−90
153 B. Libræ	6.3	2.86	18.8	24 12.2	16 7.8	+ 9 12.4	+0.0314	0.5747	0.1559	+30	−42
42 Libræ	5.0	2.91	18.3	23 32.7	19 0.0	+11 57.9	−1.0759	0.5764	0.1485	−33	−90
b Scorpii	4.7	3.02	18.5	25 29.8	23 14.3	− 7 57.8	+0.3042	0.5789	0.1371	+42	−27
A Scorpii	4.6	3.03	18.2	25 4.6	**31** 0 17.3	− 6 57.3	−0.2656	0.5795	0.1343	+13	−60
31 B. Scorpii	5.4	+3.02	−18.0	−24 17.0	0 24.7	− 6 50.1	−1.0899	0.5796	−0.1339	−35	−90
3 Scorpii	5.9	3.04	18.2	24 59.7	0 42.2	− 6 33.3	−0.4041	0.5797	0.1331	+ 5	−70
4 Scorpii	5.7	3.06	18.5	26 1.1	1 1.5	− 6 14.8	+0.5956	0.5799	0.1322	+58	−11
40 B. Scorpii	5.4	3.06	17.8	24 35.3	2 15.6	− 5 3.6	−1.0213	0.5806	0.1288	−31	−90
π Scorpii	3.0	3.09	18.3	25 52.3	2 21.0	− 4 58.4	+0.2745	0.5806	0.1286	+40	−29
48 B. Scorpii	4.9	+3.12	−18.0	−25 37.9	4 7.6	− 3 16.0	−0.1951	0.5815	−0.1236	+15	−56
65 B. Scorpii	5.5	3.16	17.8	26 6.1	5 59.5	− 1 28.5	+0.0585	0.5824	0.1183	+28	−41
85 B. Scorpii	6.0	3.20	17.2	25 15.8	8 39.4	+ 1 5.0	−1.1006	0.5838	0.1106	−38	−90
σ Scorpii	3.1	3.24	16.8	25 23.5	11 6.6	+ 3 26.3	−1.2333	0.5849	0.1034	−52	−90
α Scorpii	1.2	3.33	16.6	26 14.8	14 17.5	+ 6 29.5	−0.6756	0.5862	0.0939	−13	−90
116 B. Scorpii	6.2	+3.34	−16.6	−26 21.3	15 3.3	+ 7 13.5	−0.6352	0.5865	−0.0917	−11	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
τ Scorpii	2.9	+3.41	−16.8	−28 2.6	31 16 46.2	+ 8 52.3	+0.9354	0.5871	−0.0865	+62	+12
134 B. Scorpii	6.4	3.46	16.0	27 18.0	20 1.7	+11 59.9	−0.0893	0.5881	0.0765	+16	−49
135 B. Scorpii	6.0	3.48	16.2	28 21.3	20 17.2	−11 45.3	+0.9693	0.5882	−0.0757	+62	+14
AUGUST.											
95 G. Ophiuchi	6.1	+3.66	−14.0	−27 39.6	1 6 49.1	− 1 39.1	−0.3656	0.5905	−0.0428	− 1	−67
43 Ophiuchi	5.4	3.74	13.2	28 3.8	10 59.8	+ 2 21.4	−0.1030	0.5908	0.0295	+11	−50
163 G. Ophiuchi	6.3	3.86	11.4	27 50.8	18 37.6	+ 9 40.6	−0.4592	0.5907	−0.0051	− 9	−75
χ Sagittarii (*var.*)	4.4	3.88	11.0	27 48.1	20 15.8	+11 14.7	−0.5095	0.5905	+0.0001	−12	−79
10 G. Sagittarii	5.7	+3.94	−10.2	−28 3.3	23 45.8	− 9 23.8	−0.2299	0.5900	+0.0112	+ 3	−58
210 B. Scorpii	5.8	3.97	10.2	28 45.2	2 0 30.3	− 8 41.1	+0.4983	0.5898	0.0136	+43	−16
38 B. Sagittarii	4.7	4.01	9.2	28 28.2	4 8.4	− 5 11.8	+0.2772	0.5890	0.0250	+31	−28
C. D.−28° 14268	6.4	4.05	8.9	28 55.4	5 37.9	− 3 46.0	+0.7857	0.5886	0.0297	+61	+ 2
48 G. Sagittarii	6.3	4.06	8.4	28 19.2	7 44.2	− 1 44.7	+0.2324	0.5879	0.0363	+29	−31
62 B. Sagittarii	6.0	+4.07	− 8.3	−28 41.0	7 44.4	− 1 44.5	+0.6089	0.5879	+0.0363	+53	− 9
66 B. Sagittarii	4.7	4.01	7.9	27 4.6	8 1.0	− 1 28.6	−1.0398	0.5878	0.0372	−40	−90
58 G. Sagittarii	6.1	4.08	7.8	28 28.3	9 31.5	− 0 1.7	+0.4603	0.5873	0.0419	+43	−18
69 G. Sagittarii	6.3	4.05	6.8	26 48.7	11 55.5	+ 2 16.5	−1.1459	0.5864	0.0493	−48	−90
φ Sagittarii	3.3	4.13	5.1	27 4.9	18 47.5	+ 8 52.0	−0.4583	0.5833	0.0700	− 3	−75
σ Sagittarii	2.1	+4.14	− 4.0	−26 24.3	22 36.2	−11 28.3	−0.8710	0.5812	+0.0812	−25	−90
τ Sagittarii	3.5	4.22	3.2	27 47.9	3 3 14.5	− 7 0.9	+0.9815	0.5784	0.0945	+62	+15
201 B. Sagittarii	5.9	4.19	2.0	26 3.1	5 47.7	− 4 33.6	−0.5812	0.5768	0.1017	− 7	−85
ψ Sagittarii	4.9	4.17	− 1.7	25 24.4	6 44.2	− 3 39.3	−1.1561	0.5762	0.1043	−44	−90
51 Sagittarii	5.8	4.20	+ 0.6	24 54.5	15 6.9	+ 4 24.2	−0.7096	0.5702	0.1266	−11	−90
h Sagittarii	4.7	+4.21	+ 0.7	−25 4.4	15 23.4	+ 4 40.1	−0.5014	0.5700	+0.1273	0	−78
308 B. Sagittarii	6.3	4.20	2.4	24 9.3	22 45.6	+11 45.8	−0.4563	0.5641	0.1455	+ 5	−74
329 B. Sagittarii	6.1	4.18	3.6	22 58.4	4 1 46.9	− 9 19.5	−1.2431	0.5617	0.1526	−47	−90
336 B. Sagittarii	6.5	4.17	3.9	22 50.2	2 47.1	− 8 21.4	−1.2330	0.5608	0.1549	−46	−90
4 Capricorni	5.7	4.16	5.4	22 4.5	8 57.2	− 2 24.6	−1.0359	0.5556	0.1685	−27	−90
36 B. Capricorni	6.2	+4.19	+ 6.6	−22 40.5	13 59.7	+ 2 27.2	+0.4711	0.5512	+0.1789	+56	−18
17 Capricorni	5.8	4.16	8.4	21 49.5	21 27.7	+ 9 39.6	+0.9670	0.5446	0.1931	+68	+11
20 Capricorni	6.2	4.08	9.9	19 22.0	5 3 38.8	− 8 21.8	−0.4014	0.5392	0.2038	+14	−69
η Capricorni	4.8	4.10	10.4	20 11.6	5 52.1	− 6 12.9	+0.9300	0.5373	0.2074	+70	+ 8
114 B. Capricorni	6.1	4.01	11.4	17 41.9	10 55.4	− 1 19.6	−0.6459	0.5330	0.2150	+ 3	−89
30 Capricorni	5.4	+4.03	+11.7	−18 20.6	12 15.9	− 0 1.7	+0.3282	0.5318	+0.2170	+53	−27
31 Capricorni	6.3	4.02	11.8	17 49.2	12 24.9	+ 0 7.0	−0.1938	0.5317	0.2172	+26	−55
ι Capricorni	4.3	3.99	12.2	17 11.9	14 19.4	+ 1 57.9	−0.4379	0.5301	0.2199	+14	−71
JUPITER	−2.4	. . .	. . .	16 24.7	16 50.3	+ 4 23.9	−0.7179	0.5338	0.2253	0	−90
γ Capricorni	3.8	3.97	13.8	17 2.8	22 58.3	+10 20.3	+1.3537	0.5231	0.2309	+73	+46
42 Capricorni	5.1	+3.88	+13.8	−14 25.7	23 43.7	+11 4.3	−1.2646	0.5225	+0.2317	−37	−90
44 Capricorni	6.0	3.90	14.0	14 47.4	6 0 28.3	+11 47.6	−0.7066	0.5219	0.2326	+ 2	−90
45 Capricorni	5.8	3.90	14.1	15 8.4	0 56.1	−11 45.5	−0.2246	0.5215	0.2331	+27	−57
μ Capricorni	5.2	3.87	14.9	13 57.2	5 32.8	− 7 17.4	−0.4067	0.5181	0.2381	+19	−68
ε Aquarii	5.4	3.78	16.2	11 59.0	14 21.6	+ 1 15.5	−0.3824	0.5117	0.2461	+21	−66
σ Aquarii	4.9	+3.71	+17.7	−11 6.8	7 0 46.3	+11 21.7	+1.2871	0.5051	+0.2536	+79	+33
167 G. Aquarii	6.3	3.63	17.9	8 20.4	4 52.0	− 8 39.6	−0.6609	0.5028	0.2559	+ 9	−88
213 B. Aquarii	6.5	3.63	18.3	8 45.4	7 21.8	− 6 14.1	+0.4300	0.5014	0.2572	+66	−22
67 Aquarii	6.4	3.60	18.1	7 24.5	7 28.0	− 6 8.1	−0.9999	0.5014	0.2573	−11	−90
λ Aquarii	3.8	3.59	18.9	8 1.9	12 29.6	− 1 15.0	+0.9734	0.4988	0.2594	+82	+ 8
78 Aquarii	6.3	+3.57	+18.9	− 7 39.4	13 33.0	− 0 13.5	+0.8416	0.4983	+0.2598	+82	0
197 G. Aquarii	6.3	3.52	18.7	5 15.9	15 1.9	+ 1 13.0	−1.3645	0.4976	0.2604	−42	−90
263 B. Aquarii	6.1	3.51	19.0	5 10.1	17 19.9	+ 3 27.1	−0.8698	0.4966	0.2611	− 2	−90
82 Aquarii	6.4	3.54	19.3	7 1.8	17 52.5	+ 3 58.8	+1.2921	0.4963	0.2613	+83	+32
293 B. Aquarii	5.5	3.45	19.6	3 57.6	8 1 0.9	+10 55.3	−0.1703	0.4935	0.2629	+35	−53
316 B. Aquarii	6.5	+3.45	+19.9	− 4 22.9	3 35.0	−10 34.9	+0.9653	0.4926	+0.2633	+86	+ 7

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's						At Conjunction in R. A.						Limiting Parallels.	
Name.		Mag.	Red'ns from 1914.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x'	y'	N.	S.
			s	″	° ′	d	h m	h m				°	°
13	Piscium	6.4	+3.36	+20.0	− 1 33.3	8	10 4.9	− 4 15.6	−0.4016	0.4906	+0.2638	+24	−67
14	Piscium	5.9	3.36	20.2	− 1 43.0		11 17.7	− 3 4.8	+0.0948	0.4903	0.2638	+49	−39
21	Piscium	5.6	3.28	20.4	+ 0 36.3		19 51.1	+ 5 14.7	−0.1863	0.4884	0.2632	+35	−54
25	Piscium	6.2	3.26	20.3	1 37.1		21 52.8	+ 7 13.1	−0.7628	0.4881	0.2630	+ 5	−81
51	Piscium	5.6	3.09	20.4	6 29.2	9	19 58.2	+ 4 42.9	−0.3696	0.4871	0.2559	+25	−64
δ	Piscium	4.6	+3.03	+20.6	+ 7 7.4	10	5 5.3	−10 24.9	+1.2406	0.4881	+0.2509	+90	+29
101	Piscium	6.2	2.85	18.9	14 13.6	11	6 59.5	− 9 13.3	−0.3556	0.4953	0.2304	+26	−58
ι	Arietis	5.1	2.78	17.9	17 24.2		18 31.1	+ 1 58.7	−1.2846	0.5003	0.2180	−36	−73
35	B. Arietis	6.4	2.76	17.7	17 50.7		21 52.4	+ 5 14.3	−1.0492	0.5020	0.2140	−15	−72
47	B. Arietis	6.5	2.75	17.7	17 37.5	12	0 0.3	+ 7 18.4	−0.3520	0.5031	0.2114	+26	−55
20	H^1. Arietis	6.4	+2.75	+17.9	+16 49.6		0 51.2	+ 8 7.8	+0.7109	0.5035	+0.2103	+90	0
θ	Arietis	5.6	2.72	17.0	19 30.5		5 22.9	−11 28.4	−1.3177	0.5060	0.2045	−44	−70
26	Arietis	6.2	2.68	16.9	19 28.7		11 48.4	− 5 14.4	+0.0016	0.5097	0.1956	+44	−34
μ	Arietis	5.7	2.64	16.6	19 39.0		17 44.8	+ 0 31.3	+0.9478	0.5133	0.1868	+90	+17
ε	Arietis (*mean*)	4.6	2.59	15.9	21 0.1	13	2 6.9	+ 8 38.1	+0.9624	0.5187	0.1734	+90	+20
64	Arietis	5.8	+2.53	+14.1	+24 25.4		14 13.8	− 3 38.0	−0.8380	0.5269	+0.1518	− 3	−66
7	Tauri	5.9	2.49	14.0	24 10.8		19 2.4	+ 1 1.3	+0.1381	0.5302	0.1425	+52	−21
11	Tauri	6.1	2.48	13.5	25 3.4		21 59.8	+ 3 52.9	−0.4111	0.5323	0.1366	+21	−40
16	Tauri	5.4	2.45	13.8	24 1.4		23 53.6	+ 5 43.0	+0.9778	0.5336	0.1327	+90	+26
17	Tauri	3.8	2.45	13.8	23 50.9		23 55.8	+ 5 45.1	+1.1756	0.5337	0.1326	+90	+42
18	Tauri	5.6	+2.46	+13.6	+24 34.4	14	0 3.1	+ 5 52.1	+0.3942	0.5337	+0.1323	+69	− 7
q	Tauri	4.3	2.45	13.7	24 12.1		0 4.7	+ 5 53.7	+0.8060	0.5338	0.1323	+90	+15
20	Tauri	4.1	2.45	13.7	24 6.2		0 22.1	+ 6 10.6	+0.9524	0.5340	0.1317	+90	+24
21	Tauri	5.8	2.45	13.6	24 17.4		0 24.2	+ 6 12.6	+0.7517	0.5340	0.1316	+90	+11
22	Tauri	6.5	2.45	13.6	24 15.8		0 28.1	+ 6 16.3	+0.7893	0.5340	0.1315	+90	+14
14	H. Tauri	5.3	+2.45	+13.1	+25 19.5		2 25.7	+ 8 10.0	−0.1205	0.5354	+0.1274	+37	−33
p	Tauri	5.6	2.39	12.2	26 15.6		11 47.5	− 6 47.1	−0.0475	0.5418	0.1069	+41	−26
φ	Tauri	5.0	2.36	11.6	27 8.9		16 3.4	− 2 40.0	−0.5824	0.5446	0.0971	+11	−50
5	B. Aurigæ	5.7	2.31	10.4	28 27.1	15	1 18.9	+ 6 16.1	−1.2023	0.5504	0.0748	−37	−62
17	B. Aurigæ	6.0	2.27	10.2	27 45.4		6 19.2	+11 5.8	−0.1030	0.5533	0.0622	+38	−25
38	B. Aurigæ	6.5	+2.22	+ 9.8	+27 34.8		11 26.3	− 7 58.1	+0.3741	0.5562	+0.0490	+68	+ 1
47	B. Aurigæ	6.0	2.21	9.6	27 55.5		13 37.5	− 5 51.7	+0.1001	0.5572	0.0432	+50	−13
354	B. Tauri	6.4	2.17	9.1	27 52.4		18 25.2	− 1 14.4	+0.3325	0.5595	0.0304	+65	0
22	Aurigæ	6.4	2.18	8.7	28 51.5		19 25.0	− 0 16.8	−0.7008	0.5600	0.0277	+ 4	−50
β	Tauri	1.8	2.17	8.6	28 32.3		20 39.3	+ 0 54.8	−0.3232	0.5605	0.0244	+26	−34
107	B. Aurigæ	6.5	+2.12	+ 8.6	+27 36.6	16	0 44.4	+ 4 50.9	+0.7535	0.5622	+0.0132	+90	+24
116	B. Aurigæ	5.9	2.13	8.0	29 10.1		2 7.9	+ 6 11.3	−0.9079	0.5627	+0.0094	−10	−61
406	B. Tauri	5.6	2.08	7.9	27 56.7		7 2.4	+10 55.0	+0.4188	0.5645	−0.0043	+72	+ 7
136	Tauri	4.6	2.07	7.9	27 35.7		8 2.0	+11 52.3	+0.7884	0.5648	0.0071	+90	+27
154	B. Aurigæ	6.4	2.08	7.4	28 55.9		9 21.5	−10 51.1	−0.6556	0.5652	0.0108	+ 7	−55
415	B. Tauri	6.1	+2.04	+ 7.6	+27 34.3		11 14.2	− 9 2.6	+0.7757	0.5657	−0.0161	+90	+25
49	Aurigæ	5.1	1.94	5.9	28 5.5	17	1 23.9	+ 4 35.2	−0.2944	0.5683	0.0563	+27	−35
54	Aurigæ	5.8	1.94	5.6	28 20.5		3 11.6	+ 6 18.8	−0.6644	0.5684	0.0614	+ 6	−58
39	Geminorum	6.2	1.84	5.4	26 11.8		11 11.1	− 9 59.7	+1.0234	0.5686	0.0839	+90	+35
40	Geminorum	6.3	1.84	5.3	26 2.0		11 27.6	− 9 43.8	+1.1723	0.5685	0.0847	+90	+47
47	Geminorum	5.6	+1.83	+ 4.5	+27 0.0		16 22.5	− 5 0.0	−0.2978	0.5682	−0.0984	+27	−39
134	B. Geminorum	6.5	1.81	4.2	26 50.8		18 43.5	− 2 44.3	−0.3747	0.5680	0.1048	+23	−43
A	Geminorum	5.1	1.77	4.3	25 13.1		21 25.1	− 0 8.8	+1.0427	0.5676	0.1122	+90	+33
176	B. Geminorum	6.3	1.72	3.8	24 33.3	18	3 34.2	+ 5 46.6	+0.9929	0.5666	0.1286	+90	+28
181	B. Geminorum	6.0	1.72	3.7	24 25.1		3 58.3	+ 6 9.9	+1.0823	0.5665	0.1297	+90	+35
c	Geminorum	5.5	+1.73	+ 3.1	+25 59.4		6 0.0	+ 8 7.0	−0.8277	0.5660	−0.1350	− 3	−64
κ	Geminorum	3.7	1.71	3.4	24 36.4		6 9.7	+ 8 16.3	+0.5956	0.5660	0.1354	+86	+ 4
5	B. Cancri	6.4	1.66	2.8	23 49.3		13 7.3	− 9 1.5	+0.4064	0.5641	0.1533	+70	− 8
4	Cancri	6.2	1.68	2.5	25 19.7		13 24.1	− 8 45.4	−1.2029	0.5640	0.1539	−33	−65
9	Cancri	6.2	1.63	2.7	22 53.0		15 21.9	− 6 51.9	+1.0306	0.5635	0.1588	+90	+28
35	B. Cancri	6.4	+1.62	+ 2.2	+23 23.9		18 29.0	− 3 51.7	−0.0122	0.5625	−0.1664	+43	−30

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's Name.	Mag.	Red'ns from 1914.0. Δα	Δδ	Apparent Declination.	At Conjunction in R. A. Washington Mean Time.	Hour Angle, H	Y	x'	y'	Limiting Parallels. N.	S.
		s	″	° ′	d h m	h m				°	°
				NEW	MOON.						
9 B. Virginis	6.2	+1.32	− 8.3	+ 0 9.4	22 19 38.0	− 6 2.9	−0.5444	0.5355	−0.2889	+16	−77
31 B. Virginis	6.4	1.35	9.2	− 1 17.4	23 1 13.4	− 0 38.4	−0.7122	0.5359	0.2884	+ 8	−90
62 B. Virginis	6.2	1.40	10.6	4 8.5	13 40.0	+11 23.3	−1.4299	0.5379	0.2841	−55	−90
f Virginis	6.0	+1.43	−11.2	− 5 21.7	17 46.4	− 8 38.5	−1.3757	0.5389	−0.2818	−43	−90
χ Virginis	4.8	1.42	11.8	7 31.5	18 53.9	− 7 33.2	+0.4689	0.5392	0.2811	+70	−20
ψ Virginis	5.0	1.47	12.7	9 4.5	24 1 47.8	− 0 53 3	+0.0953	0.5413	0.2758	+47	−39
49 Virginis	5.2	1.53	13.3	10 17.1	7 55.6	+ 5 2.0	−0.3712	0.5436	0.2701	+23	−65
50 Virginis	6.2	1.54	13.3	9 52.5	8 46.1	+ 5 50.7	−1.0079	0.5439	0.2693	−13	−90
i Virginis	5.7	+1.61	−14.3	−12 15.9	16 21.4	−10 49.6	−0.6306	0.5471	−0.2606	+ 8	−85
75 Virginis	5.6	1.63	15.2	14 55.5	19 3.8	− 8 12.9	+1.3309	0.5484	0.2571	+75	+40
50 B. Virginis	6.0	1.65	14.6	12 46.7	19 52.6	− 7 25.7	−1.0272	0.5488	0.2560	−16	−90
83 Virginis	5.6	1.70	15.6	15 45.1	25 0 10.8	− 3 16.6	+0.8614	0.5509	0.2500	+74	+ 2
85 Virginis	6.1	1.70	15.5	15 20.4	0 39.7	− 2 48.7	+0.3293	0.5511	0.2492	+56	−27
14 G. Virginis	6.5	+1.82	−15.9	−15 55.7	9 11.5	+ 5 24.9	−1.1502	0.5556	−0.2356	−28	−90
43 H. Virginis	5.5	1.88	16.6	17 48.3	13 32.4	+ 9 36.4	−0.2760	0.5580	0.2279	+22	−60
31 G. Virginis	6.4	1.90	16.6	18 11.4	14 14.6	+10 17.1	−0.0478	0.5584	0.2266	+33	−47
36 G. Virginis	5.7	1.90	16.8	18 19.4	14 54.9	+10 56.0	−0.0674	0.5587	0.2254	+32	−49
9 G. Libræ	6.5	2.02	17.3	20 4.0	21 44.8	− 6 29.1	+0.1927	0.5626	0.2120	+44	−34
17 G. Libræ	6.4	+2.10	−17.6	−20 49.0	26 2 28.4	− 1 56.1	−0.0313	0.5654	−0.2020	+31	−46
18 G. Libræ	6.1	2.10	17.6	20 58.2	2 54.3	− 1 31.2	+0.0359	0.5656	0.2011	+35	−42
43 B. Libræ	5.7	2.23	18.7	21 2.0	7 5.6	+ 2 30.7	−0.7222	0.5680	0.1917	− 5	−90
47 G. Libræ	6.1	2.26	17.6	21 42.2	10 48.7	+ 6 5.4	−0.7446	0.5701	0.1830	− 8	−90
64 G. Libræ	5.8	2.33	17.5	22 5.2	14 51.1	+10 58.5	−1.0776	0.5723	0.1732	−30	−90
53 B. Libræ	6.3	+2.48	−17.9	−24 12.2	21 34.8	− 7 33.4	−0.0442	0.5758	−0.1560	+26	−47
42 Libræ	5.0	2.52	17.5	23 32.6	27 0 26.3	− 4 48.4	−1.1479	0.5772	0.1484	−38	−90
b Scorpii	4.7	2.63	17.8	25 29.7	4 39.6	− 0 45.0	+0.2300	0.5791	0.1370	+38	−31
A Scorpii	4.6	2.65	17.6	25 4.6	5 42.5	+ 0 15.3	−0.3385	0.5796	0.1340	+ 9	−65
31 B. Scorpii	5.4	2.64	17.3	24 16.9	5 49.9	+ 0 22.5	−1.1614	0.5796	0.1337	−41	−90
3 Scorpii	5.9	+2.66	−17.5	−24 59.7	6 7.3	+ 0 39.2	−0.4767	0.5797	−0.1329	+ 2	−74
4 Scorpii	5.7	2.67	17.8	26 1.1	6 26.5	+ 0 57.7	+0.5216	0.5799	0.1320	+54	−15
40 B. Scorpii	5.4	2.68	17.2	24 35.3	7 40.5	+ 2 8.7	−1.0926	0.5805	0.1285	−36	−90
π Scorpii	3.0	2.70	17.6	25 52.3	7 45.9	+ 2 13.9	+0.2014	0.5804	0.1283	+36	−33
48 B. Scorpii	4.9	2.73	17.4	25 37.9	9 32.3	+ 3 56.1	−0.2671	0.5812	0.1233	+11	−60
65 B. Scorpii	5.5	+2.78	−17.3	−26 6.1	11 24.2	+ 5 43.6	−0.0131	0.5819	−0.1179	+24	−45
85 B. Scorpii	6.0	2.82	16.7	25 15.8	14 4.0	+ 8 17.0	−1.1708	0.5828	0.1101	−45	−90
α Scorpii	1.2	2.95	16.4	26 14.8	19 42.7	−10 17.9	−0.7448	0.5846	0.0934	−16	−90
16 B. Scorpii	6.2	2.97	16.3	26 21.3	20 28.7	− 9 33.7	−0.7041	0.5848	0.0911	−15	−90
τ Scorpii	2.9	3.04	16.7	28 2.6	22 11.9	− 7 54.7	+0.8681	0.5852	0.0859	+62	+ 7
34 B. Scorpii	6.4	+3.09	−15.9	−27 18.0	28 1 28.1	− 4 46.4	−0.1563	0.5859	−0.0759	+13	−53
35 B. Scorpii	6.0	3.11	16.2	28 21.3	1 43.7	− 4 31.4	+0.9038	0.5860	0.0751	+62	+10
95 G. Ophiuchi	6.1	3.32	14.3	27 39.6	12 19.5	+ 5 38.7	−0.4294	0.5871	0.0422	− 4	−72
43 Ophiuchi	5.4	3.41	13.6	28 3.9	16 32.4	+ 9 41.4	−0.1646	0.5870	0.0289	+ 8	−54
63 G. Ophiuchi	6.3	3.55	12.0	27 50.8	29 0 14.9	− 6 54.8	−0.5192	0.5862	−0.0047	−12	−80
X Sagittarii (*var.*)	4.4	+3.58	−11.6	−27 48.1	1 54.2	− 5 19.5	−0.5691	0.5859	+0.0005	−15	−85
10 G. Sagittarii	5.7	3.66	10.9	28 3.3	5 26.7	− 1 55.5	−0.2870	0.5851	0.0115	0	−62
10 B. Scorpii	5.8	3.69	11.0	28 45.2	6 11.8	− 1 12.3	+0.4448	0.5849	0.0139	+40	−19
38 B. Sagittarii	4.7	3.74	10.1	28 28.2	9 52.6	+ 2 19.7	+0.2243	0.5839	0.0252	+28	−31
C. D.−28° 14268	6.4	3.78	9.9	28 55.4	11 23.4	+ 3 46.9	+0.7361	0.5833	0.0299	+61	− 2
48 G. Sagittarii	6.3	+3.81	− 9.4	−28 19.2	13 31.4	+ 5 49.8	+0.1809	0.5826	+0.0364	+27	−34
62 B. Sagittarii	6.0	3.82	9.3	28 41.1	13 31.6	+ 5 50.0	+0.5595	0.5826	0.0364	+49	−12
66 B. Sagittarii	4.7	3.77	8.7	27 4.6	13 48.5	+ 6 6.3	−1.0980	0.5825	0.0373	−44	−90
58 G. Sagittarii	6.1	3.84	8.8	28 28.3	15 20.3	+ 7 34.4	+0.4109	0.5818	0.0420	+40	−21
69 G. Sagittarii	6.3	3.82	7.7	26 48.7	17 46.4	+ 9 54.7	−1.2033	0.5808	0.0493	−53	−90
φ Sagittarii	3.3	+3.94	− 6.1	−27 4.9	30 0 44.8	− 7 23.2	−0.5089	0.5774	+0.0698	− 6	−79

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.				
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y	x′	y′
		s	″	° ′	d h m	h m			
σ Sagittarii	2.1	+3.97	− 5.0	−26 24.4	30 4 37.2	− 3 39.8	−0.9228	0.5753	+0.0809
τ Sagittarii	3.5	4.07	4.4	27 47.9	9 20.0	+ 0 52.1	+0.9440	0.5724	0.0940
201 B. Sagittarii	5.9	4.05	3.0	26 3.2	11 55.9	+ 3 22.1	−0.6280	0.5708	0.1011
ψ Sagittarii	4.9	4.04	2.6	25 24.4	12 53.4	+ 4 17.4	−1.2065	0.5701	0.1037
248 B. Sagittarii	5.7	4.16	1.6	27 9.8	18 47.9	+ 9 58.6	+1.2924	0.5660	0.1191
51 Sagittarii	5.8	+4.11	− 0.3	−24 54.5	21 24.8	−11 30.4	−0.7533	0.5641	+0.1257
h Sagittarii	4.7	4.12	− 0.3	25 4.5	21 41.6	−11 14.1	−0.5435	0.5639	0.1265
308 B. Sagittarii	6.3	4.15	+ 2.1	24 9.3	31 5 11.5	− 4 0.7	−0.4949	0.5582	0.1445
329 B. Sagittarii	6.1	4.14	2.8	22 58.4	8 16.1	− 1 2.8	−1.2859	0.5558	0.1515
336 B. Sagittarii	6.5	4.14	3.2	22 50.2	9 17.3	− 0 3.8	−1.2752	0.5550	0.1538
4 Capricorni	5.7	+4.17	+ 4.8	−22 4.5	15 33.9	+ 5 59.6	−1.0738	0.5500	+0.1673
36 B. Capricorni	6.2	4.22	5.9	22 40.5	20 41.5	+10 56.5	+0.4464	0.5458	0.1777

SEPTEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y	x′	y′
17 Capricorni	5.8	+4.23	+ 7.9	−21 49.5	1 4 17.0	− 5 43.5	+0.9493	0.5396	+0.1918
20 Capricorni	6.2	4.18	9.7	19 22.0	10 33.9	+ 0 20.9	−0.4257	0.5345	0.2025
η Capricorni	4.8	4.21	10.0	20 11.6	12 49.3	+ 2 31.9	+0.9157	0.5328	0.2061
Jupiter	−2.3	. . .	. . .	17 27.1	17 30.7	+ 7 4.2	−1.0265	0.5339	0.2147
114 B. Capricorni	6.1	4.15	11.6	17 41.9	17 57.1	+ 7 29.7	−0.6683	0.5287	0.2138
30 Capricorni	5.4	+4.18	+11.7	−18 20.6	19 18.7	+ 8 48.8	+0.3127	0.5277	+0.2158
31 Capricorni	6.3	4.16	11.8	17 49.2	19 27.9	+ 8 57.7	−0.2126	0.5276	0.2160
ι Capricorni	4.3	4.15	12.4	17 11.9	21 24.0	+10 50.1	−0.4573	0.5261	0.2186
γ Capricorni	3.8	4.17	14.1	17 2.8	2 6 9.7	− 4 40.7	+1.3488	0.5196	0.2298
42 Capricorni	5.1	4.08	14.4	14 25.7	6 55.7	− 3 56.1	−1.2844	0.5191	0.2307
44 Capricorni	6.0	+4.10	+14.7	−14 47.4	7 40.8	− 3 12.4	−0.7227	0.5186	+0.2316
45 Capricorni	5.8	4.11	14.7	15 8.4	8 9.0	− 2 45.1	−0.2378	0.5182	0.2321
μ Capricorni	5.2	4.10	15.7	13 57.2	12 48.9	+ 1 46.3	−0.4189	0.5151	0.2371
e Aquarii	5.4	4.04	17.4	11 59.0	21 43.2	+10 24.7	−0.3906	0.5094	0.2454
σ Aquarii	4.9	4.02	19.1	11 6.8	3 8 13.2	− 3 23.7	+1.2904	0.5035	0.2532
167 G. Aquarii	6.3	+3.96	+19.8	− 8 20.3	12 20.6	+ 0 36.7	−0.6641	0.5015	+0.2556
213 B. Aquarii	6.5	3.96	20.2	8 45.4	14 51.3	+ 3 3.1	+0.4319	0.5003	0.2570
67 Aquarii	6.4	3.94	20.2	7 24.5	14 57.6	+ 3 9.3	−1.0035	0.5001	0.2570
λ Aquarii	3.8	3.94	20.9	8 1.9	20 0.8	+ 8 3.9	+0.9788	0.4980	0.2594
78 Aquarii	6.3	3.93	21.0	7 39.4	21 4.6	+ 9 5.9	+0.8469	0.4976	0.2598
197 G. Aquarii	6.3	+3.88	+21.2	− 5 15.8	22 33.9	+10 32.7	−1.3662	0.4969	+0.2604
263 B. Aquarii	6.1	3.88	21.4	5 10.1	4 0 52.6	−11 12.5	−0.8691	0.4961	0.2611
82 Aquarii	6.4	3.92	21.5	7 1.8	1 25.3	−10 40.7	+1.2999	0.4959	0.2613
293 B. Aquarii	5.5	3.85	22.3	3 57.5	8 35.2	− 3 42.7	−0.1650	0.4934	0.2632
316 B. Aquarii	6.5	3.87	22.5	4 22.9	11 9.7	− 1 12.5	+0.9743	0.4927	0.2636
13 Piscium	6.4	+3.80	+23.0	− 1 33.3	17 40.4	+ 5 7.6	−0.3943	0.4911	+0.2643
14 Piscium	5.9	3.81	23.2	− 1 43.0	18 53.3	+ 6 18.5	+0.1035	0.4908	0.2643
21 Piscium	5.6	3.76	23.7	+ 0 36.3	5 3 27.0	− 9 21.7	−0.1763	0.4893	0.2639
25 Piscium	6.2	3.74	23.8	1 37.1	5 28.8	− 7 23.2	−0.7535	0.4890	0.2637
51 Piscium	5.6	3.66	24.5	6 29.2	6 3 32.6	− 9 55.0	−0.3564	0.4887	0.2568
δ Piscium	4.6	+3.63	+24.7	+ 7 7.4	12 38.5	− 1 3.9	+1.2565	0.4898	+0.2518
101 Piscium	6.2	3.55	23.5	14 13.7	7 14 29.8	+ 0 4.7	−0.3422	0.4966	0.2309
4 Arietis	5.8	3.53	22.8	16 32.0	21 8.7	+ 6 32.3	−1.3865	0.4992	0.2239
ι Arietis	5.1	3.52	22.5	17 24.3	8 2 1.1	+11 16.4	−1.2743	0.5013	0.2184
35 B. Arietis	6.4	3.51	22.2	17 50.8	5 22.5	− 9 27.9	−1.0387	0.5028	0.2143
47 B. Arietis	6.5	+3.50	+22.3	+17 37.6	7 30.5	− 7 23.7	−0.3402	0.5038	+0.2117
20 H^1. Arietis	6.4	3.50	22.3	16 49.7	8 21.4	− 6 34.2	+0.7252	0.5042	0.2105
θ Arietis	5.6	3.49	21.5	19 30.6	12 53.5	− 2 10.1	−1.3093	0.5065	0.2046
26 Arietis	6.2	3.47	21.2	19 28.8	19 19.9	+ 4 4.9	+0.0128	0.5098	0.1955
μ Arietis	5.7	3.45	20.8	19 39.1	9 1 17.6	+ 9 51.8	+0.9615	0.5130	0.1866
ε Arietis (*mean*)	4.6	+3.43	+19.9	+21 0.2	9 42.0	− 5 59.1	+0.9754	0.5178	+0.1729

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
64 Arietis	5.8	+3.41	+17.8	+24 25.5	9 21 54.0	+ 5 49.9	−0.8350	0.5252	+0.1511	− 3	−66
7 Tauri	5.9	3.38	17.4	24 10.9	10 2 45.2	+10 31.9	+0.1452	0.5281	0.1417	+53	−20
11 Tauri	6.1	3.38	16.8	25 3.4	5 44.3	−10 34.9	−0.4075	0.5299	0.1357	+22	−49
16 Tauri	5.4	3.35	17.0	24 1.5	7 39.2	− 8 43.6	+0.9887	0.5311	0.1318	+90	+27
17 Tauri	3.8	3.35	17.0	23 50.9	7 41.4	− 8 41.5	+1.1877	0.5311	0.1317	+90	+43
18 Tauri	5.6	+3.36	+16.8	+24 34.5	7 48.8	− 8 34.4	+0.4020	0.5312	+0.1315	+69	− 6
q Tauri	4.3	3.34	17.0	24 12.2	7 50.4	− 8 32.8	+0.8160	0.5312	0.1314	+90	+16
20 Tauri	4.1	3.34	16.9	24 6.3	8 8.0	− 8 15.9	+0.9631	0.5313	0.1309	+90	+25
21 Tauri	5.8	3.34	16.8	24 17.5	8 10.1	− 8 13.8	+0.7613	0.5313	0.1308	+90	+13
22 Tauri	6.5	3.34	16.8	24 15.9	8 14.1	− 8 9.9	+0.7991	0.5314	0.1306	+90	+15
14 H. Tauri	5.3	+3.36	+16.2	+25 19.5	10 13.0	− 6 14.9	−0.1161	0.5326	+0.1265	+38	−32
p Tauri	5.6	3.31	14.9	26 15.7	19 41.6	+ 2 54.8	−0.0445	0.5383	0.1060	+42	−26
φ Tauri	5.0	3.30	14.0	27 9.0	11 0 0.9	+ 7 5.3	−0.5838	0.5407	0.0962	+11	−56
5 B. Aurigæ	5.7	3.26	12.4	28 27.2	9 24.7	− 7 50.3	−1.2101	0.5458	0.0740	−38	−62
17 B. Aurigæ	6.0	3.21	11.9	27 45.5	14 29.9	− 2 55.7	−0.1037	0.5483	0.0615	+38	−25
38 B. Aurigæ	6.5	+3.16	+11.2	+27 34.8	19 42.2	+ 2 5.6	+0.3763	0.5508	+0.0484	+68	+ 1
47 B. Aurigæ	6.0	3.15	10.9	27 55.6	21 55.8	+ 4 14.5	+0.0999	0.5518	0.0426	+50	−13
354 B. Tauri	6.4	3.11	10.2	27 52.4	12 2 48.8	+ 8 57.1	+0.3333	0.5538	0.0299	+65	0
22 Aurigæ	6.4	3.12	9.6	28 51.5	3 49.7	+ 9 55.7	−0.7085	0.5541	0.0273	+ 3	−60
β Tauri	1.8	3.11	9.4	28 32.3	5 5.4	+11 8.7	−0.3280	0.5546	0.0239	+25	−34
107 B. Aurigæ	6.5	+3.05	+ 9.2	+27 36.6	9 15.2	− 8 50.5	+0.7569	0.5561	+0.0129	+90	+25
116 B. Aurigæ	5.9	3.07	8.5	29 10.1	10 40.4	− 7 28.3	−0.9185	0.5565	+0.0091	−11	−61
406 B. Tauri	5.6	2.99	8.2	27 56.7	15 40.8	− 2 38.8	+0.4185	0.5580	−0.0044	+72	+ 7
136 Tauri	4.6	2.98	8.1	27 35.7	16 41.5	− 1 40.4	+0.7911	0.5583	0.0072	+90	+27
154 B. Aurigæ	6.4	3.00	7.4	28 55.9	18 2.7	− 0 22.0	−0.6652	0.5586	0.0109	+ 6	−56
415 B. Tauri	6.1	+2.95	+ 7.6	+27 34.3	19 57.6	+ 1 28.6	+0.7778	0.5591	−0.0161	+90	+25
49 Aurigæ	5.1	2.82	5.1	28 5.5	13 10 25.0	− 8 35.7	−0.3030	0.5613	0.0557	+27	−35
54 Aurigæ	5.8	2.80	4.8	28 20.5	12 14.9	− 6 49.9	−0.6762	0.5614	0.0608	+ 5	−59
39 Geminorum	6.2	2.66	4.2	26 11.8	20 24.4	+ 1 1.7	+1.0245	0.5616	0.0830	+90	+35
40 Geminorum	6.3	2.66	4.2	26 2.0	20 41.2	+ 1 17.8	+1.1746	0.5616	0.0837	+90	+47
47 Geminorum	5.6	+2.63	+ 3.0	+27 0.0	14 1 42.2	+ 6 7.7	−0.3076	0.5614	−0.0973	+27	−39
134 B. Geminorum	6.5	2.61	2.7	26 50.8	4 6.0	+ 8 26.2	−0.3852	0.5612	0.1037	+23	−44
A Geminorum	5.1	2.54	2.8	25 13.0	6 50.8	+11 4.9	+1.0427	0.5609	0.1109	+90	+33
176 B. Geminorum	6.3	2.46	2.0	24 33.2	13 6.9	− 6 52.7	+0.9918	0.5601	0.1272	+90	+28
181 B. Geminorum	6.0	2.45	2.0	24 25.1	13 31.5	− 6 29.0	+1.0818	0.5600	0.1282	+90	+35
c Geminorum	5.5	+2.46	+ 1.2	+25 59.4	15 35.5	− 4 29.5	−0.8416	0.5596	−0.1335	− 4	−64
κ Geminorum	3.7	2.43	1.6	24 36.3	15 45.3	− 4 20.1	+0.5916	0.5596	0.1340	+86	+ 4
5 B. Cancri	6.4	2.34	0.8	23 49.2	22 50.3	+ 2 29.5	+0.4006	0.5582	0.1517	+69	− 8
4 Cancri	6.2	2.37	0.3	25 19.6	23 7.4	+ 2 45.9	−1.2187	0.5581	0.1523	−35	−65
9 Cancri	6.2	2.30	0.7	22 52.9	15 1 7.1	+ 4 41.3	+1.0285	0.5576	0.1572	+90	+28
35 B. Cancri	6.4	+2.28	+ 0.1	+23 23.8	4 17.3	+ 7 44.7	−0.0206	0.5569	−0.1648	+43	−30
η Cancri	5.5	2.15	− 0.5	20 44.0	12 32.5	− 8 17.9	+1.3056	0.5547	0.1837	+90	+52
39 Cancri	6.5	2.11	0.8	20 18.7	15 45.9	− 5 11.4	+1.1364	0.5538	0.1908	+90	+32
40 Cancri	6.5	2.11	0.8	20 16.5	15 48.1	− 5 9.3	+1.1669	0.5538	0.1909	+90	+34
γ Cancri	4.7	2.12	1.4	21 46.7	17 8.1	− 3 52.1	−0.6434	0.5534	0.1937	+ 9	−67
12 B. Leonis	6.3	+1.88	− 2.8	+16 57.4	16 11 49.5	− 9 50.2	+0.3363	0.5479	−0.2303	+64	−20
8 Leonis	5.9	1.85	3.4	16 49.4	16 57.8	− 4 52.5	−0.7328	0.5465	0.2390	+ 5	−73
11 Leonis	6.5	1.81	3.1	14 44.1	17 25.4	− 4 25.9	+1.2807	0.5463	0.2398	+90	+39
ψ Leonis	5.6	1.79	3.4	14 24.9	19 59.2	− 1 57.4	+0.9853	0.5457	0.2439	+90	+14
ν Leonis	5.0	1.72	3.9	12 51.3	17 2 32.1	+ 4 22.0	+0.9337	0.5440	0.2537	+90	+10
				NEW	*MOON.*						
83 Virginis	5.6	+1.49	−13.9	−15 45.0	21 8 23.5	+ 6 43.9	+0.8821	0.5607	−0.2540	+74	+ 3
85 Virginis	6.1	1.50	13.9	15 20.4	8 51.5	+ 7 10.9	+0.3581	0.5610	0.2533	+59	−25
214 G. Virginis	6.5	1.58	14.3	15 55.7	17 6.6	− 8 52.3	−1.0958	0.5656	0.2395	−24	−90
43 H. Virginis	5.5	+1.62	−14.8	−17 48.2	21 19.0	− 4 49.3	−0.2331	0.5680	−0.2316	+24	−57

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
231 G. Virginis	6.4	+1.62	−14.8	−18 11.4	21 21 59.9	− 4 9.9	−0.0084	0.5684	−0.2303	+35	−44
236 G. Virginis	5.7	1.63	15.0	18 19.3	22 38.9	− 3 32.4	−0.0273	0.5688	0.2290	+34	−46
9 G. Libræ	6.5	1.71	15.5	20 4.0	22 5 15.6	+ 2 49.4	+0.2311	0.5726	0.2154	+46	−3
17 G. Libræ	6.4	1.77	15.8	20 49.0	9 50.2	+ 7 13.4	+0.0121	0.5752	0.2052	+33	−44
18 G. Libræ	6.1	1.78	15.8	20 58.1	10 15.2	+ 7 37.4	+0.0784	0.5755	0.2042	+37	−40
43 B. Libræ	5.7	+1.89	−17.1	−21 2.0	14 18.6	+11 31.4	−0.6671	0.5777	−0.1946	− 2	−90
47 G. Libræ	6.1	1.90	15.9	21 42.1	17 54.9	− 9 0.8	−0.6882	0.5796	0.1858	− 4	−90
64 G. Libræ	5.8	1.96	15.9	22 5.2	21 50.1	− 5 14.8	−1.0155	0.5816	0.1757	−25	−90
153 B. Libræ	6.3	2.08	16.3	24 12.2	23 4 22.0	+ 1 1.4	+0.0050	0.5847	0.1581	+28	−44
42 Libræ	5.0	2.12	16.0	23 32.6	7 8.6	+ 3 41.4	−1.0831	0.5859	0.1504	−33	−90
b Scorpii	4.7	+2.21	−16.4	−25 29.7	11 15.0	+ 7 37.8	+0.2774	0.5875	−0.1386	+41	−29
A Scorpii	4.6	2.23	16.2	25 4.5	12 16.2	+ 8 36.5	−0.2834	0.5878	0.1357	+12	−61
31 B. Scorpii	5.4	2.22	15.9	24 16.9	12 23.4	+ 8 43.4	−1.0956	0.5879	0.1353	−36	−90
3 Scorpii	5.9	2.23	16.1	24 59.6	12 40.4	+ 8 59.8	−0.4198	0.5880	0.1345	+ 5	−71
4 Scorpii	5.7	2.24	16.4	26 1.1	12 59.1	+ 9 17.7	+0.5656	0.5881	0.1336	+57	−1
40 B. Scorpii	5.4	+2.26	−15.9	−24 35.3	14 11.1	+10 26.7	−1.0275	0.5885	−0.1301	−31	−90
π Scorpii	3.0	2.27	16.3	25 52.3	14 16.3	+10 31.7	+0.2499	0.5886	0.1298	+39	−30
48 B. Scorpii	4.9	2.29	16.1	25 37.8	16 0.0	−11 48.8	−0.2121	0.5891	0.1247	+14	−5
65 B. Scorpii	5.5	2.35	16.0	26 6.1	17 49.1	−10 4.1	+0.0389	0.5897	0.1192	+26	−4
85 B. Scorpii	6.0	2.38	15.6	25 15.8	20 25.0	− 7 34.5	−1.1040	0.5903	0.1113	−39	−90
σ Scorpii	3.1	+2.43	−15.4	−25 23.5	22 48.9	− 5 16.6	−1.2347	0.5909	−0.1040	−52	−90
α Scorpii	1.2	2.50	15.4	26 14.8	24 1 55.7	− 2 17.5	−0.6826	0.5915	0.0943	−13	−90
116 B. Scorpii	6.2	2.51	15.3	26 21.3	2 40.6	− 1 34.4	−0.6423	0.5916	0.0919	−11	−90
τ Scorpii	2.9	2.57	15.7	28 2.6	4 21.6	+ 0 2.4	+0.9126	0.5918	0.0867	+62	+10
134 B. Scorpii	6.4	2.62	15.1	27 18.0	7 33.6	+ 3 6.5	−0.0999	0.5922	0.0765	+15	−5
135 B. Scorpii	6.0	+2.64	−15.4	−28 21.3	7 48.9	+ 3 21.2	+0.9489	0.5922	−0.0757	+62	+13
95 G. Ophiuchi	6.1	2.85	13.8	27 39.6	18 12.7	−10 40.7	−0.3691	0.5921	0.0424	− 1	−68
43 Ophiuchi	5.4	2.94	13.3	28 3.8	22 21.4	− 6 42.2	−0.1061	0.5915	0.0290	+11	−5
163 G. Ophiuchi	6.3	3.08	11.9	27 50.8	25 5 57.4	+ 0 35.2	−0.4575	0.5897	−0.0046	− 9	−7
X Sagittarii (*var.*)	4.4	3.11	11.6	27 48.1	7 35.4	+ 2 9.1	−0.5070	0.5892	+0.0006	−12	−7
10 G. Sagittarii	5.7	+3.18	−11.0	−28 3.3	11 5.5	+ 5 30.7	−0.2268	0.5879	+0.0116	+ 3	−5
210 B. Scorpii	5.8	3.21	11.2	28 45.2	11 50.0	+ 6 13.4	+0.5003	0.5876	0.0140	+44	−1
38 B. Sagittarii	4.7	3.28	10.4	28 28.2	15 28.7	+ 9 43.2	+0.2817	0.5861	0.0254	+31	−2
C. D.−28° 14268	6.4	3.32	10.3	28 55.4	16 58.7	+11 9.6	+0.7906	0.5854	0.0300	+61	+ 1
48 G. Sagittarii	6.3	3.35	9.8	28 19.2	19 5.6	−10 48.6	+0.2388	0.5844	0.0365	+30	−3
62 B. Sagittarii	6.0	+3.35	− 9.7	−28 41.1	19 5.8	−10 48.4	+0.6153	0.5844	+0.0365	+53	−
66 B. Sagittarii	4.7	3.31	9.1	27 4.6	19 22.5	−10 32.3	−1.0330	0.5842	0.0374	−40	−90
58 G. Sagittarii	6.1	3.38	9.3	28 28.3	20 53.6	− 9 4.9	+0.4676	0.5833	0.0420	+44	−1
68 G. Sagittarii	6.2	3.37	8.2	26 41.3	23 10.0	− 6 53.9	−1.2726	0.5822	0.0489	−62	−90
69 G. Sagittarii	6.3	3.38	8.2	26 48.7	23 18.7	− 6 45.6	−1.1384	0.5821	0.0493	−47	−90
φ Sagittarii	3.3	+3.50	− 6.8	−27 4.9	26 6 14.8	− 0 5.9	−0.4479	0.5779	+0.0698	− 3	−74
σ Sagittarii	2.1	3.55	5.8	26 24.4	10 6.4	+ 3 36.7	−0.8606	0.5753	0.0808	−24	−90
τ Sagittarii	3.5	3.66	5.4	27 47.9	14 48.8	+ 8 8.2	+1.0005	0.5719	0.0938	+62	+10
201 B. Sagittarii	5.9	3.65	4.0	26 3.2	17 24.4	+10 37.9	−0.5677	0.5700	0.1008	− 6	−84
ψ Sagittarii	4.9	3.64	3.6	25 24.4	18 21.9	+11 33.2	−1.1451	0.5693	0.1034	−42	−90
51 Sagittarii	5.8	+3.74	− 1.4	−24 54.5	27 2 53.9	− 4 13.9	−0.6944	0.5625	+0.1252	−10	−90
h Sagittarii	4.7	3.76	− 1.4	25 4.5	3 10.8	− 3 57.6	−0.4848	0.5622	0.1259	+ 1	−70
308 B. Sagittarii	6.3	3.81	+ 0.3	24 9.3	10 42.2	+ 3 17.4	−0.4375	0.5559	0.1437	+ 5	−7
329 B. Sagittarii	6.1	3.82	1.7	22 58.4	13 47.7	+ 6 16.2	−1.2296	0.5533	0.1506	−46	−90
336 B. Sagittarii	6.5	3.82	2.1	22 50.2	14 49.2	+ 7 15.5	−1.2193	0.5524	0.1529	−44	−90
4 Capricorni	5.7	+3.87	+ 3.6	−22 4.5	21 8.1	−10 38.8	−1.0198	0.5470	+0.1661	−26	−90
36 B. Capricorni	6.2	3.94	4.6	22 40.6	28 2 18.0	− 5 39.6	+0.5009	0.5426	0.1763	+58	−1
17 Capricorni	5.8	3.99	6.5	21 49.6	9 57.3	+ 1 44.2	+1.0030	0.5361	0.1902	+68	+13
20 Capricorni	6.2	3.97	8.6	19 22.0	16 17.8	+ 7 52.2	−0.3774	0.5309	0.2006	+15	−0
η Capricorni	4.8	+4.01	+ 8.8	20 11.6	18 34.5	+10 4.5	+0.9669	0.5290	0.2042	+70	+10
JUPITER	−2.2	. . .	. . .	−18 0.3	19 29.7	+10 57.9	−1.1851	0.5300	+0.2061	−33	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
Capricorni	6.1	+3.97	+10.6	−17 41.9	28 23 45.5	− 8 54.5	−0.6239	0.5249	+0.2118	+ 4	−86
Capricorni	5.4	4.00	10.7	18 20.6	29 1 8.0	− 7 34.5	+0.3596	0.5239	0.2137	+55	−25
Capricorni	6.3	3.99	10.8	17 49.2	1 17.3	− 7 25.5	−0.1675	0.5239	0.2139	+28	−53
Capricorni	4.3	3.98	11.4	17 11.9	3 14.6	− 5 31.9	−0.4139	0.5224	0.2166	+15	−69
Capricorni	5.1	3.96	13.7	14 25.7	12 52.7	+ 3 48.4	−1.2490	0.5153	0.2284	−35	−90
Capricorni	6.0	+3.98	+14.0	−14 47.4	13 38.4	+ 4 32.7	−0.6857	0.5148	+0.2293	+ 3	−90
Capricorni	5.8	3.99	13.9	15 8.4	14 6.8	+ 5 0.2	−0.1992	0.5145	0.2298	+28	−55
Capricorni	5.2	4.00	15.1	13 57.2	18 49.9	+ 9 34.8	−0.3836	0.5114	0.2348	+20	−67
Aquarii	5.4	3.99	17.1	11 59.0	30 3 50.2	− 5 40.9	−0.3607	0.5059	0.2431	+22	−65
Aquarii	4.9	4.01	18.8	11 6.8	14 27.1	+ 4 37.7	+1.3201	0.5004	0.2508	+79	+37
Aquarii	6.3	+3.97	+20.0	− 8 20.3	18 37.0	+ 8 40.6	−0.6457	0.4985	+0.2533	+ 9	−86
Aquarii	6.5	3.99	20.3	8 45.4	21 9.3	+11 8.6	+0.4529	0.4974	0.2547	+68	−21
Aquarii	6.4	3.96	20.5	7 24.5	21 15.6	+11 14.7	−0.9885	0.4973	0.2548	−10	−90

OCTOBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
Aquarii	3.8	+3.99	+21.1	− 8 1.9	1 2 21.8	− 7 47.7	+0.9979	0.4953	+0.2572	+82	+ 9
Aquarii	6.3	3.98	21.3	7 39.4	3 26.2	− 6 45.1	+0.8646	0.4950	0.2576	+82	+ 1
Aquarii	6.3	3.94	21.9	5 15.8	4 56.3	− 5 17.5	−1.3586	0.4944	0.2582	−41	−90
Aquarii	6.1	3.95	22.1	5 10.1	7 16.2	− 3 1.4	−0.8614	0.4936	0.2590	− 2	−90
Aquarii	6.4	+3.99	+21.9	− 7 1.8	7 49.3	− 2 29.2	+1.3157	0.4935	+0.2592	+83	+35
Aquarii	5.5	3.96	23.2	3 57.5	15 2.8	+ 4 32.4	−0.1610	0.4914	0.2611	+35	−53
Aquarii	6.5	3.98	23.3	4 22.9	17 38.4	+ 7 3.7	+0.9802	0.4908	0.2617	+86	+ 8
Piscium	6.4	3.95	24.4	1 33.2	2 0 12.0	−10 33.3	−0.3995	0.4895	0.2625	+24	−67
Piscium	5.9	3.96	24.4	− 1 42.9	1 25.3	− 9 22.0	+0.0990	0.4893	0.2626	+49	−39
Piscium	5.6	+3.95	+25.3	+ 0 36.3	10 2.1	− 0 59.1	−0.1899	0.4883	+0.2624	+34	−54
Piscium	6.2	3.94	25.6	1 37.2	12 4.5	+ 1 0.1	−0.7708	0.4881	0.2622	+ 4	−79
Piscium	5.6	3.95	27.0	6 29.3	3 10 12.9	− 1 27.2	−0.3937	0.4890	0.2559	+24	−65
Piscium	4.6	3.97	27.2	7 7.5	19 19.6	+ 7 24.7	+1.2139	0.4905	0.2512	+90	+27
Piscium	6.2	4.01	26.8	14 13.8	4 21 10.8	+ 8 33.3	−0.4131	0.4982	0.2306	+23	−62
Arietis	5.1	+4.04	+26.1	+17 24.3	5 8 41.3	− 4 15.9	−1.3572	0.5029	+0.2181	−48	−73
B. Arietis	6.4	4.05	25.9	17 50.9	12 2.5	− 1 0.5	−1.1243	0.5045	0.2141	−21	−72
B. Arietis	6.5	4.04	25.8	17 37.6	14 10.3	+ 1 3.6	−0.4261	0.5055	0.2114	+22	−59
H¹. Arietis	6.4	4.05	25.7	16 49.7	15 1.2	+ 1 53.1	+0.6407	0.5060	0.2103	+88	− 4
Arietis	6.2	4.08	24.7	19 28.9	6 1 59.3	−11 28.2	−0.0822	0.5114	0.1953	+40	−39
Arietis	5.7	+4.08	+24.2	+19 39.1	7 56.9	− 5 41.3	+0.8643	0.5146	+0.1862	+90	+12
Arietis (*mean*)	4.6	4.10	23.2	21 0.2	16 21.7	+ 2 28.1	+0.8725	0.5192	0.1725	+90	+14
Arietis	5.8	4.15	21.0	24 25.6	7 4 35.0	− 9 41.5	−0.9521	0.5259	0.1505	−11	−66
Tauri	5.9	4.14	20.4	24 10.9	9 27.2	− 4 58.6	+0.0286	0.5286	0.1411	+46	−26
Tauri	6.1	4.15	19.8	25 3.5	12 27.0	− 2 4.6	−0.5281	0.5303	0.1351	+15	−56
Tauri	5.4	+4.12	+19.8	+24 1.5	14 22.5	− 0 12.9	+0.8730	0.5313	+0.1312	+90	+19
Tauri	3.8	4.12	19.8	23 51.0	14 24.7	− 0 10.7	+1.0728	0.5313	0.1311	+90	+33
Tauri	5.6	4.14	19.6	24 34.5	14 32.2	− 0 3.5	+0.2835	0.5314	0.1308	+61	−12
Tauri	4.3	4.13	19.7	24 12.2	14 33.8	− 0 2.0	+0.6994	0.5314	0.1308	+90	+ 9
Tauri	4.1	4.12	19.7	24 6.3	14 51.4	+ 0 15.0	+0.8470	0.5316	0.1302	+90	+18
Tauri	5.8	+4.13	+19.6	+24 17.5	14 53.5	+ 0 17.1	+0.6442	0.5316	+0.1301	+90	+ 6
Tauri	6.5	4.13	19.6	24 16.0	14 57.5	+ 0 21.0	+0.6822	0.5316	0.1300	+90	+ 8
Tauri	3.0	4.12	19.6	23 50.7	15 38.6	+ 1 0.8	+1.2366	0.5320	0.1286	+90	+48
Tauri	5.2	4.12	19.5	23 52.8	16 26.6	+ 1 47.2	+1.3002	0.5324	0.1269	+90	+59
H. Tauri	5.3	4.15	19.0	25 19.6	16 57.1	+ 2 16.7	−0.2382	0.5327	0.1258	+31	−39
Tauri	5.6	+4.14	+17.3	+26 15.7	8 2 29.2	+11 29.8	−0.1714	0.5376	+0.1052	+34	−33
Tauri	5.0	4.15	16.4	27 9.0	6 50.7	− 8 17.4	−0.7159	0.5397	0.0954	+ 3	−63
Tauri	5.3	4.11	16.7	25 25.9	7 53.4	− 7 16.8	+1.2820	0.5402	0.0930	+90	+60
B. Aurigæ	6.0	4.11	13.6	27 45.5	21 28.7	+ 5 50.6	−0.2396	0.5461	0.0607	+30	−32
B. Aurigæ	6.5	4.07	12.6	27 34.8	9 2 45.0	+10 56.1	+0.2419	0.5481	0.0476	+59	− 6
B. Aurigæ	6.0	+4.06	+12.1	+27 55.6	5 0.5	−10 53.2	−0.0374	0.5488	+0.0420	+42	−20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Lim ing P all
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.
		s	″	° ′	d h m	h m				°
354 B. Tauri	6.4	+4.03	+11.1	+27 52.4	9 9 57.9	– 6 6.3	+0.1964	0.5504	+0.0294	+5
22 Aurigæ	6.4	4.06	10.6	28 51.5	10 59.8	– 5 6.5	–0.8543	0.5506	0.0267	– 7
β Tauri	1.8	4.04	10.3	28 32.3	12 16.7	– 3 52.3	–0.4712	0.5509	0.0233	+17
107 B. Aurigæ	6.5	3.98	9.8	27 36.6	16 30.7	+ 0 12.7	+0.6220	0.5520	0.0124	+90
116 B. Aurigæ	5.9	4.01	9.0	29 10.1	17 57.4	+ 1 36.3	–1.0688	0.5524	+0.0086	–24
406 B. Tauri	5.6	+3.93	+ 8.4	+27 56.7	23 3.4	+ 6 31.5	+0.2791	0.5533	–0.0047	+6
136 Tauri	4.6	3.91	8.3	27 35.7	10 0 5.3	+ 7 31.1	+0.6550	0.5535	0.0074	+90
154 B. Aurigæ	6.4	3.94	7.6	28 55.9	1 28.0	+ 8 50.8	–0.8156	0.5537	0.0110	– 4
415 B. Tauri	6.1	3.88	7.6	27 34.3	3 25.3	+10 44.0	+0.6412	0.5540	0.0162	+90
49 Aurigæ	5.1	3.76	4.3	28 5.5	18 12.0	+ 0 59.0	–0.4530	0.5549	0.0552	+18
54 Aurigæ	5.8	+3.74	+ 3.8	+28 20.5	20 4.5	+ 2 47.4	–0.8307	0.5549	–0.0602	– 5
39 Geminorum	6.2	3.58	2.9	26 11.7	11 4 26.4	+10 51.3	+0.8892	0.5544	0.0819	+90
40 Geminorum	6.3	3.58	2.8	26 2.0	4 43.7	+11 8.1	+1.0410	0.5544	0.0827	+90
47 Geminorum	5.6	3.55	1.3	26 59.9	9 52.7	– 7 54.0	–0.4588	0.5538	0.0959	+18
134 B. Geminorum	6.5	3.52	0.8	26 50.7	12 20.4	– 5 31.6	–0.5372	0.5535	0.1022	+14
A Geminorum	5.1	+3.43	+ 0.9	+25 13.0	15 9.8	– 2 48.2	+0.9084	0.5530	–0.1093	+90
176 B. Geminorum	6.3	3.34	– 0.2	24 33.2	21 36.6	+ 3 24.9	+0.8578	0.5519	0.1252	+90
181 B. Geminorum	6.0	3.33	0.2	24 25.1	22 1.9	+ 3 49.2	+0.9490	0.5518	0.1262	+90
c Geminorum	5.5	3.34	1.2	25 59.3	12 0 9.5	+ 5 52.3	–0.9985	0.5513	0.1314	–1
κ Geminorum	3.7	3.30	0.8	24 36.3	0 19.6	+ 6 2.1	+0.4528	0.5512	0.1317	+73
5 B. Cancri	6.4	+3.19	– 1.9	+23 49.2	7 37.1	–10 55.8	+0.2611	0.5496	–0.1490	+60
9 Cancri	6.2	3.14	2.0	22 52.9	9 58.0	– 8 40.0	+0.8977	0.5490	0.1544	+90
35 B. Cancri	6.4	3.11	2.8	23 23.8	13 13.8	– 5 31.0	–0.1639	0.5482	0.1618	+35
η Cancri	5.5	2.94	3.5	20 44.0	21 43.9	+ 2 41.4	+1.1823	0.5460	0.1803	+90
39 Cancri	6.5	2.88	3.9	20 18.7	13 1 3.0	+ 5 53.7	+1.0125	0.5450	0.1872	+90
40 Cancri	6.5	+2.89	– 3.9	+20 16.5	1 5.3	+ 5 55.9	+1.0434	0.5450	–0.1873	+90
102 B. Cancri	6.5	2.87	3.8	19 58.4	1 10.2	+ 6 0.6	+1.3432	0.5450	0.1875	+90
γ Cancri	4.7	2.90	4.6	21 46.6	2 27.7	+ 7 15.4	–0.7892	0.5446	0.1901	9
139 B. Cancri	6.1	2.80	4.3	19 9.2	5 51.0	+10 31.8	+1.2978	0.5437	0.1970	+90
12 B. Leonis	6.3	2.56	6.2	16 57.3	21 41.3	+ 1 49.8	+0.2147	0.5398	0.2261	+50
7 Leonis	6.2	+2.47	– 6.3	+14 45.7	14 2 27.1	+ 6 25.9	+1.3779	0.5387	–0.2339	+90
8 Leonis	5.9	2.50	7.0	16 49.3	2 57.9	+ 6 55.7	–0.8620	0.5387	0.2347	– 3
11 Leonis	6.5	2.45	6.5	14 44.1	3 26.2	+ 7 23.0	+1.1741	0.5386	0.2355	+90
ψ Leonis	5.6	2.42	6.7	14 24.8	6 4.0	+ 9 55.5	+0.8776	0.5381	0.2395	+90
ν Leonis	5.0	2.32	7.2	12 51.2	12 46.6	– 7 35.3	+0.8313	0.5370	0.2493	+90
α Leonis	1.3	+2.25	– 7.7	+12 23.1	17 29.9	– 3 1.4	+0.1149	0.5363	–0.2556	+50
44 Leonis	5.9	2.14	7.9	9 13.2	15 1 21.6	+ 4 34.5	+1.2805	0.5357	0.2650	+90
45 Leonis	5.8	2.14	8.3	10 11.9	2 28.1	+ 5 38.9	–0.0062	0.5356	0.2662	+44
ρ Leonis	3.8	2.11	8.5	9 44.8	4 52.6	+ 7 58.6	–0.1930	0.5355	0.2687	+34
49 Leonis	5.7	2.09	8.5	9 5.6	5 55.2	+ 8 59.1	+0.1876	0.5355	0.2698	+54
37 Sextantis	6.3	+2.01	– 8.6	+ 6 49.5	11 5.0	–10 1.4	+1.0674	0.5355	–0.2746	+90
56 Leonis	6.1	1.97	9.0	6 38.5	15 42.8	– 5 32.7	–0.0312	0.5357	0.2784	+42
c Leonis	5.1	1.95	9.3	6 33.7	17 54.8	– 3 25.1	–0.5642	0.5359	0.2801	+15
75 Leonis	5.4	1.84	9.4	2 28.9	16 1 36.8	+ 4 1.7	+1.3405	0.5369	0.2848	+90
79 Leonis	5.5	1.81	9.5	1 52.6	4 44.7	+ 7 3.3	+1.0459	0.5374	0.2863	+90
83 Leonis	6.3	+1.78	– 9.8	+ 3 28.8	6 1.8	+ 8 17.9	–0.9179	0.5377	–0.2868	– 4
τ Leonis	5.2	1.82	10.0	3 19.6	6 32.7	+ 8 47.8	–0.9140	0.5378	0.2870	– 4
				NEW	*MOON.*					
153 B. Libræ	6.3	+1.86	–14.6	–24 12.1	20 13 37.9	–11 54.7	+0.1221	0.5958	–0.1598	+34
42 Libræ	5.0	+1.89	–14.4	–23 32.6	16 18.9	– 9 20.3	–0.9454	0.5971	–0.1520	–24
b Scorpii	4.7	1.96	14.7	25 29.7	20 17.1	– 5 32.1	+0.3985	0.5989	0.1400	+48
A Scorpii	4.6	1.96	14.5	25 4.5	21 16.2	– 4 35.5	–0.1522	0.5993	0.1370	+18
31 B. Scorpii	5.4	1.96	14.4	24 16.9	21 23.2	– 4 28.8	–0.9513	0.5993	0.1367	–26
3 Scorpii	5.9	1.97	14.5	24 59.6	21 39.6	– 4 13.0	–0.2859	0.5994	0.1358	+11
4 Scorpii	5.7	+1.98	–14.7	–26 1.0	21 57.7	– 3 55.7	+0.6841	0.5996	–0.1340	+6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. $\Delta\alpha$	Red'ns from 1914.0. $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
B. Scorpii	5.4	+1.98	−14.3	−24 35.3	20 23 7.3	− 2 49.1	−0.8819	0.6000	−0.1313	−22	−90
Scorpii	3.0	2.00	14.6	25 52.3	23 12.3	− 2 44.3	+0.3749	0.6000	0.1311	+45	−23
B. Scorpii	4.9	2.02	14.4	25 37.8	21 0 52.5	− 1 8.4	−0.0777	0.6006	0.1259	+21	−48
B. Scorpii	6.4	2.02	14.2	24 29.6	1 5.9	− 0 55.5	−1.2294	0.6007	0.1252	−50	−90
B. Scorpii	5.5	2.06	14.4	26 6.0	2 37.8	+ 0 32.5	+0.1714	0.6012	0.1203	+33	−34
B. Scorpii	6.0	+2.08	−14.0	−25 15.8	5 8.4	+ 2 56.7	−0.9502	0.6019	−0.1123	−28	−90
Scorpii	3.1	2.11	13.9	25 23.5	7 27.4	+ 5 9.8	−1.0760	0.6025	0.1049	−37	−90
VENUS	−4.3	. . .	. . .	27 2.0	8 53.7	+ 6 32.5	+0.4067	0.5852	0.0958	+44	−21
Scorpii	1.2	2.17	13.9	26 14.8	10 27.8	+ 8 2.5	−0.5297	0.6031	0.0950	− 5	−80
B. Scorpii	6.2	2.18	13.8	26 21.3	11 11.2	+ 8 44.1	−0.4893	0.6032	0.0926	− 3	−77
Scorpii	2.9	+2.23	−14.1	−28 2.5	12 48.7	+10 17.4	+1.0415	0.6034	−0.0873	+62	+20
B. Scorpii	6.4	2.27	13.6	27 18.0	15 54.2	−10 45.0	+0.0490	0.6037	0.0770	+23	−41
B. Scorpii	6.0	2.28	13.8	28 21.2	16 9.0	−10 30.8	+1.0806	0.6037	0.0762	+62	+24
G. Ophiuchi	6.1	2.45	12.6	27 39.6	22 2 11.8	− 0 53.8	−0.2059	0.6032	0.0423	+ 7	−56
Ophiuchi	5.4	2.52	12.2	28 3.8	6 12.3	+ 2 56.4	+0.0562	0.6025	0.0288	+19	−41
G. Ophiuchi	6.3	+2.64	−11.1	−27 50.8	13 33.6	+ 9 59.0	−0.2834	0.6001	−0.0040	0	−62
Sagittarii (*var.*)	4.4	2.67	10.8	27 48.1	15 8.5	+11 29.9	−0.3309	0.5995	+0.0012	− 3	−65
G. Sagittarii	6.2	2.66	10.5	26 56.9	15 29.4	+11 49.9	−1.1921	0.5994	0.0024	−55	−90
G. Sagittarii	5.7	2.74	10.4	28 3.3	18 32.1	− 9 15.1	−0.0526	0.5980	0.0124	+13	−47
B. Scorpii	5.8	2.76	10.5	28 45.2	19 15.3	− 8 33.6	+0.6637	0.5976	0.0148	+56	− 6
B. Sagittarii	4.7	+2.82	− 9.8	−28 28.2	22 47.4	− 5 10.5	+0.4511	0.5957	+0.0263	+42	−18
C. D.−28° 14268	6.4	2.85	9.7	28 55.4	23 0 14.7	− 3 46.8	+0.9534	0.5949	0.0310	+61	+14
G. Sagittarii	6.3	2.88	9.4	28 19.2	2 17.9	− 1 48.6	+0.4115	0.5937	0.0376	+40	−21
B. Sagittarii	6.0	2.89	9.3	28 41.1	2 18.1	− 1 48.4	+0.7823	0.5937	0.0376	+61	+ 2
B. Sagittarii	4.7	2.85	8.7	27 4.6	2 34.4	− 1 32.8	−0.8413	0.5935	0.0385	−27	−90
G. Sagittarii	6.1	+2.91	− 8.9	−28 28.3	4 2.9	− 0 7.9	+0.6381	0.5926	+0.0432	+56	− 7
G. Sagittarii	6.2	2.91	8.0	26 41.3	6 15.4	+ 1 59.1	−1.0752	0.5911	0.0501	−42	−90
G. Sagittarii	6.3	2.92	8.0	26 48.7	6 23.9	+ 2 7.3	−0.9429	0.5910	0.0505	−33	−90
B. Sagittarii	6.5	2.91	7.9	26 38.4	6 43.4	+ 2 26.0	−1.1019	0.5908	0.0516	−44	−90
Sagittarii	3.3	3.03	6.8	27 4.9	13 8.8	+ 8 35.8	−0.2586	0.5860	0.0711	+ 7	−60
Sagittarii	2.1	+3.07	− 5.9	−26 24.4	16 54.5	−11 47.6	−0.6640	0.5830	+0.0822	−13	−90
Sagittarii	3.5	3.18	5.6	27 47.9	21 29.9	− 7 23.1	+1.1748	0.5791	0.0952	+62	+33
B. Sagittarii	5.9	3.17	4.4	26 3.2	24 0 2.0	− 4 57.0	−0.3719	0.5769	0.1022	+ 5	−67
Sagittarii	4.9	3.17	4.0	25 24.4	0 58.2	− 4 2.9	−0.9417	0.5760	0.1047	−27	−90
Sagittarii	4.9	3.21	3.0	24 40.6	4 55.0	− 0 15.3	−1.2640	0.5724	0.1152	−54	−90
Sagittarii	5.8	+3.28	− 2.1	−24 54.5	9 19.3	+ 3 58.9	−0.4942	0.5682	+0.1265	0	−77
Sagittarii	4.7	3.29	2.1	25 4.5	9 35.8	+ 4 14.9	−0.2869	0.5680	0.1271	+11	−61
B. Sagittarii	6.3	3.36	− 0.6	24 9.4	16 58.9	+11 21.5	−0.2384	0.5607	0.1448	+15	−58
B. Sagittarii	6.1	3.37	+ 0.8	22 58.5	20 1.2	− 9 42.8	−1.0222	0.5577	0.1517	−28	−90
B. Sagittarii	6.5	3.38	1.0	22 50.2	21 1.8	− 8 44.4	−1.0119	0.5567	0.1539	−27	−90
Capricorni	5.7	+3.44	+ 2.5	−22 4.5	25 3 14.9	− 2 44.6	−0.8144	0.5506	+0.1669	−13	−90
B. Capricorni	6.2	3.52	3.3	22 40.6	8 20.7	+ 2 10.6	+0.6932	0.5456	0.1769	+67	− 6
Capricorni	5.8	3.58	5.1	21 49.6	15 54.9	+ 9 29.3	+1.1918	0.5383	0.1905	+68	+30
Capricorni	6.2	3.58	7.2	19 22.0	22 12.0	− 8 26.2	−0.1802	0.5324	0.2007	+25	−54
Capricorni	4.8	3.62	7.3	20 11.6	26 0 27.6	− 6 15.0	+1.1554	0.5304	0.2041	+70	+25
JUPITER	−2.0	. . .	. . .	−17 52.2	1 59.9	− 4 45.7	−0.9995	0.5269	+0.2057	−19	−90
B. Capricorni	6.1	+3.61	+ 9.2	17 41.9	5 36.5	− 1 16.1	−0.4278	0.5258	0.2115	+14	−70
Capricorni	5.4	3.64	9.2	18 20.6	6 58.6	+ 0 3.4	+0.5499	0.5246	0.2133	+66	−15
Capricorni	6.3	3.63	9.4	17 49.3	7 7.8	+ 0 12.4	+0.0256	0.5245	0.2135	+37	−43
Capricorni	4.3	3.63	10.0	17 11.9	9 4.6	+ 2 5.5	−0.2205	0.5229	0.2161	+25	−56
Capricorni	5.1	+3.64	+12.3	−14 25.7	18 40.5	+11 23.6	−1.0580	0.5152	+0.2275	−20	−90
Capricorni	6.0	3.66	12.6	14 47.4	19 26.0	−11 52.3	−0.4973	0.5146	0.2283	+13	−75
Capricorni	5.8	3.68	12.6	15 8.4	19 54.4	−11 24.8	−0.0128	0.5142	0.2288	+38	−45
Capricorni	5.2	3.70	13.7	13 57.2	27 0 37.0	− 6 50.7	−0.1999	0.5109	0.2336	+29	−55
Aquarii	5.4	3.72	15.8	11 59.0	9 37.2	+ 1 53.6	−0.1847	0.5049	0.2414	+31	−54
G. Aquarii	6.3	+3.75	+19.0	− 8 20.4	28 0 25.7	− 7 43.3	−0.4851	0.4969	+0.2512	+18	−73

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. $\Delta\alpha$	Red'ns from 1914.0. $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
213 B. Aquarii	6.5	+3.78	+19.2	− 8 45.4	28 2 58.4	− 5 14.9	+0.6099	0.4957	+0.2525	+78	−13
67 Aquarii	6.4	3.75	19.6	7 24.5	3 4.8	− 5 8.7	−0.8309	0.4956	0.2525	− 1	−90
λ Aquarii	3.8	3.80	20.0	8 1.9	8 12.1	− 0 10.0	+1.1484	0.4935	0.2548	+82	+20
78 Aquarii	6.3	3.80	20.2	7 39.4	9 16.7	+ 0 52.8	+1.0138	0.4931	0.2552	+82	+11
252 B. Aquarii	5.8	3.76	21.0	5 26.4	9 37.4	+ 1 13.0	−1.3156	0.4930	0.2553	−36	−90
197 G. Aquarii	6.3	+3.76	+21.1	− 5 15.8	10 47.2	+ 2 20.9	−1.2114	0.4926	+0.2558	−26	−90
263 B. Aquarii	6.1	3.78	21.4	5 10.1	13 7.6	+ 4 37.5	−0.7174	0.4918	0.2566	+ 6	−90
293 B. Aquarii	5.5	3.82	22.5	3 57.5	20 56.3	−11 46.7	−0.0284	0.4895	0.2586	+42	−45
316 B. Aquarii	6.5	3.86	22.6	4 22.9	23 32.7	− 9 14.5	+1.1098	0.4889	0.2591	+86	+17
13 Piscium	6.4	3.85	24.0	1 33.3	29 6 8.1	− 2 49.8	−0.2813	0.4877	0.2598	+30	−59
14 Piscium	5.9	+3.86	+24.1	− 1 43.0	7 21.8	− 1 38.1	+0.2157	0.4874	+0.2599	+56	−33
21 Piscium	5.6	3.89	25.3	+ 0 36.3	16 1.2	+ 6 47.4	−0.0882	0.4865	0.2597	+39	−49
25 Piscium	6.2	3.88	25.7	1 37.2	18 4.1	+ 8 47.1	−0.6735	0.4864	0.2595	+ 9	−88
51 Piscium	5.6	4.00	27.7	6 29.3	30 16 18.2	+ 6 25.6	−0.3377	0.4879	0.2534	+27	−62
δ Piscium	4.6	4.06	28.0	7 7.5	31 1 26.6	− 8 40.9	+1.2540	0.4898	0.2488	+90	+30

NOVEMBER.

Name.	Mag.	$\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
101 Piscium	6.2	+4.23	+28.7	+14 13.8	1 3 19.9	− 7 30.2	−0.4277	0.4987	+0.2288	+22	−63
35 B. Arietis	6.4	4.35	28.1	17 50.9	18 11.0	+ 6 55.5	−1.1693	0.5057	0.2125	−25	−72
47 B. Arietis	6.5	+4.36	+28.0	+17 37.7	20 18.7	+ 8 59.5	−0.4748	0.5068	+0.2099	+19	−62
20 H¹. Arietis	6.4	4.37	27.7	16 49.7	21 9.5	+ 9 48.9	+0.5910	0.5072	0.2088	+83	− 6
26 Arietis	6.2	4.46	27.0	19 28.9	2 8 6.2	− 3 33.9	−0.1535	0.5131	0.1939	+36	−42
μ Arietis	5.7	4.49	26.4	19 39.2	14 2.9	+ 2 12.1	+0.7823	0.5165	0.1850	+90	+ 8
ε Arietis (*mean*)	4.6	4.56	25.4	21 0.2	22 26.3	+10 20.1	+0.7751	0.5213	0.1713	+90	+ 9
64 Arietis	5.8	+4.69	+23.4	+24 25.6	3 10 37.5	− 1 51.7	−1.0721	0.5283	+0.1493	−21	−66
7 Tauri	5.9	4.70	22.7	24 11.0	15 28.8	+ 2 50.3	−0.0988	0.5310	0.1399	+38	−33
11 Tauri	6.1	4.74	22.1	25 3.5	18 28.2	+ 5 43.9	−0.6610	0.5327	0.1339	+ 7	−63
16 Tauri	5.4	4.72	21.9	24 1.5	20 23.3	+ 7 35.2	+0.7382	0.5337	0.1300	+90	+12
17 Tauri	3.8	4.71	21.9	23 51.0	20 25.5	+ 7 37.5	+0.9381	0.5337	0.1299	+90	+24
18 Tauri	5.6	+4.73	+21.8	+24 34.6	20 33.0	+ 7 44.7	+0.1480	0.5338	+0.1296	+53	−19
q Tauri	4.3	4.72	21.8	24 12.3	20 34.6	+ 7 46.2	+0.5642	0.5338	0.1296	+83	+ 2
20 Tauri	4.1	4.72	21.8	24 6.4	20 52.2	+ 8 3.2	+0.7115	0.5339	0.1290	+90	+10
21 Tauri	5.8	4.72	21.8	24 17.6	20 54.3	+ 8 5.2	+0.5085	0.5340	0.1289	+78	− 1
22 Tauri	6.5	4.72	21.8	24 16.0	20 58.3	+ 8 9.1	+0.5464	0.5340	0.1288	+81	+ 1
23 Tauri	4.3	+4.71	+21.8	+23 41.2	21 6.7	+ 8 17.3	+1.2071	0.5341	+0.1285	+90	+45
η Tauri	3.0	4.72	21.7	23 50.8	21 39.2	+ 8 48.8	+1.1002	0.5344	0.1274	+90	+36
27 Tauri	3.7	4.72	21.6	23 47.8	22 26.6	+ 9 34.6	+1.2541	0.5348	0.1257	+90	+51
28 Tauri	5.2	4.72	21.5	23 52.8	22 27.2	+ 9 35.2	+1.1627	0.5348	0.1257	+90	+41
14 H. Tauri	5.3	4.76	21.2	25 19.6	22 57.5	+10 4.5	−0.3781	0.5351	0.1247	+23	−46
p Tauri	5.6	+4.81	+19.4	+26 15.8	4 8 28.6	− 4 43.3	−0.3262	0.5399	+0.1040	+26	−41
φ Tauri	5.0	4.84	18.3	27 9.1	12 49.6	− 0 31.0	−0.8781	0.5419	0.0942	− 8	−63
χ Tauri	5.3	4.80	18.4	25 25.9	13 52.3	+ 0 29.6	+1.1215	0.5424	0.0918	+90	+41
17 B. Aurigæ	6.0	4.88	15.0	27 45.5	5 3 27.6	−10 23.0	−0.4221	0.5478	0.0594	+20	−43
38 B. Aurigæ	6.5	4.86	13.7	27 34.8	8 44.4	− 5 17.2	+0.0537	0.5494	0.0463	+47	−15
47 B. Aurigæ	6.0	+4.87	+13.2	+27 55.6	11 0.2	− 3 6.1	−0.2294	0.5500	+0.0406	+31	−30
354 B. Tauri	6.4	4.85	11.9	27 52.5	15 58.4	+ 1 41.6	−0.0011	0.5513	0.0280	+44	−17
22 Aurigæ	6.4	4.89	11.5	28 51.5	17 0.6	+ 2 41.7	−1.0571	0.5515	0.0254	−23	−61
β Tauri	1.8	4.88	11.1	28 32.3	18 17.8	+ 3 56.2	−0.6741	0.5518	0.0221	+ 5	−57
107 B. Aurigæ	6.5	4.82	10.3	27 36.6	22 33.0	+ 8 2.4	+0.4183	0.5525	0.0111	+71	+ 7
112 B. Aurigæ	5.7	+4.79	+10.4	+26 52.5	23 5.8	+ 8 34.0	+1.2321	0.5526	+0.0097	+90	+59
406 B. Tauri	5.6	4.81	8.6	27 56.7	6 5 8.0	− 9 36.5	+0.0664	0.5533	−0.0059	+48	−11
136 Tauri	4.6	4.79	8.4	27 35.7	6 10.3	− 8 36.4	+0.4431	0.5534	0.0086	+73	+ 8
154 B. Aurigæ	6.4	4.84	7.7	28 55.9	7 33.7	− 7 16.0	−1.0365	0.5535	0.0122	−21	−61
415 B. Tauri	6.1	4.77	7.5	27 34.3	9 31.8	− 5 22.0	+0.4256	0.5536	0.0173	+72	+ 6
49 Aurigæ	5.1	+4.69	+ 3.5	+28 5.5	7 0 27.4	+ 9 1.8	−0.6907	0.5531	−0.0560	+ 4	−60

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
Aurigæ	5.8	+4.68	+ 2.9	+28 20.4	7 2 21.4	+10 51.8	−1.0730	0.5529	−0.0609	−24	−62
Geminorum	6.2	4.51	1.4	26 11.7	10 50.4	− 4 57.2	+0.6526	0.5515	0.0824	+90	+12
Geminorum	6.3	4.51	+ 1.3	26 1.9	11 7.9	− 4 40.3	+0.8055	0.5515	0.0831	+90	+21
Geminorum	5.6	4.50	− 0.4	26 59.9	16 22.0	+ 0 22.8	−0.7114	0.5504	0.0960	+ 3	−63
Geminorum	6.1	4.42	0.2	25 2.1	17 51.6	+ 1 49.2	+1.2678	0.5501	0.0997	+90	+57
B. Geminorum	6.5	+4.47	− 1.1	+26 50.7	18 52.3	+ 2 47.8	−0.7927	0.5498	−0.1022	− 2	−63
Geminorum	5.1	4.37	1.2	25 13.0	21 44.8	+ 5 34.3	+0.6645	0.5491	0.1091	+90	+10
B. Geminorum	6.3	4.28	2.6	24 33.2	8 4 19.4	+11 55.2	+0.6095	0.5472	0.1247	+88	+ 5
B. Geminorum	6.0	4.27	2.7	24 25.0	4 45.2	−11 39.9	+0.7014	0.5470	0.1257	+90	+10
Geminorum	5.5	4.30	3.7	25 59.3	6 55.5	− 9 34.1	−1.2681	0.5464	0.1307	−45	−64
Geminorum	3.7	+4.24	− 3.4	+24 36.2	7 5.9	− 9 24.0	+0.1988	0.5464	−0.1311	+56	−16
Geminorum	6.3	4.18	3.3	23 21.2	8 57.6	− 7 36.2	+1.2948	0.5458	0.1353	+90	+57
B. Cancri	6.4	4.13	4.9	23 49.1	14 33.4	− 2 11.9	+0.0011	0.5439	0.1478	+44	−28
Cancri	6.2	4.07	5.1	22 52.8	16 57.8	+ 0 7.5	+0.6441	0.5431	0.1531	+90	+ 4
B. Cancri	6.4	4.04	6.1	23 23.7	20 18.6	+ 3 21.4	−0.4316	0.5420	0.1602	+20	−53
Cancri	5.5	+3.84	− 7.2	+20 43.9	9 5 2.5	+11 47.6	+0.9296	0.5389	−0.1781	+90	+18
Cancri	6.5	3.79	7.6	20 18.6	8 27.3	− 8 54.4	+0.7572	0.5377	0.1848	+90	+ 7
Cancri	6.5	3.79	7.6	20 16.4	8 29.7	− 8 52.1	+0.7884	0.5377	0.1848	+90	+ 9
B. Cancri	6.5	3.77	7.6	19 58.4	8 34.7	− 8 47.3	+1.0922	0.5377	0.1850	+90	+28
Cancri	6.3	3.78	7.5	19 50.9	8 37.2	− 8 44.9	+1.2175	0.5377	0.1851	+90	+40
Cancri	4.7	+3.81	− 8.5	+21 46.6	9 54.5	− 7 30.2	−1.0693	0.5372	−0.1875	−19	−68
B. Cancri	6.1	3.69	8.3	19 9.1	13 23.9	− 4 7.7	+1.0463	0.5360	0.1941	+90	+24
B. Leonis	6.3	3.42	10.7	16 57.3	10 5 44.6	+11 40.7	−0.0498	0.5310	0.2220	+41	−39
Leonis	6.2	3.30	10.8	14 45.7	10 40.1	− 7 33.3	+1.1335	0.5298	0.2294	+90	+26
Leonis	5.9	3.35	11.6	16 49.2	11 11.9	− 7 2.7	−1.1413	0.5296	0.2302	−22	−73
Leonis	6.5	+3.29	−11.0	+14 44.0	11 41.2	− 6 34.3	+0.9270	0.5295	−0.2309	+90	+11
Leonis	5.6	3.25	11.3	14 24.7	14 24.5	− 3 56.2	+0.6273	0.5289	0.2348	+86	− 6
Leonis	5.0	3.13	11.9	12 51.1	21 21.2	+ 2 47.1	+0.5848	0.5276	0.2441	+81	−10
Leonis	1.3	3.05	12.4	12 23.1	11 2 14.4	+ 7 31.0	−0.1392	0.5268	0.2501	+36	−47
Leonis	5.9	2.91	12.6	9 13.1	10 22.8	− 8 36.3	+1.0531	0.5261	0.2591	+90	+16
Leonis	5.8	+2.91	−13.0	+10 11.9	11 31.8	− 7 29.5	−0.2530	0.5260	−0.2603	+31	−55
Leonis	3.8	2.87	13.2	9 44.8	14 1.4	− 5 4.6	−0.4401	0.5259	0.2627	+21	−66
Leonis	5.7	2.84	13.2	9 5.5	15 6.2	− 4 1.9	−0.0521	0.5259	0.2637	+41	−44
Sextantis	6.3	2.75	13.1	6 49.4	20 26.9	+ 1 8.6	+0.8488	0.5260	0.2684	+90	+ 2
Leonis	6.1	2.69	13.6	6 38.5	12 1 14.2	+ 5 46.7	−0.2604	0.5263	0.2721	+30	−57
Leonis	5.1	+2.66	−13.9	+ 6 33.6	3 30.8	+ 7 59.0	−0.7983	0.5266	−0.2737	+ 2	−73
Leonis	5.4	2.53	13.6	2 28.8	11 28.2	− 8 18.9	+1.1488	0.5278	0.2783	+90	+20
Leonis	6.0	2.51	13.5	2 7.1	12 15.2	− 7 33.4	+1.2961	0.5280	0.2786	+90	+33
Leonis	5.5	2.48	13.6	1 52.6	14 42.3	− 5 11.1	+0.8555	0.5285	0.2798	+90	+ 1
Leonis	6.3	2.45	14.1	3 28.7	16 1.8	− 3 54.1	−1.1348	0.5289	0.2803	−19	−87
Leonis	5.2	+2.48	−14.3	+ 3 19.6	16 33.6	− 3 23.4	−1.1297	0.5290	−0.2805	−18	−87
Leonis	4.5	2.40	13.6	− 0 21.2	20 51.5	+ 0 46.2	+1.3724	0.5303	0.2819	+90	+42
B. Virginis	6.2	2.34	14.3	+ 0 9.3	13 2 34.8	+ 6 18.4	−0.7560	0.5322	0.2830	+ 5	−82
B. Virginis	6.4	2.29	14.5	− 1 17.5	8 12.7	+11 45.2	−0.8981	0.5346	0.2833	− 3	−90
B. Virginis	6.5	2.19	13.8	5 14.7	14 21.9	− 6 17.7	+1.3090	0.5375	0.2827	+85	+34
Virginis	4.8	+2.09	−14.2	− 7 31.6	14 1 47.1	+ 4 44.4	+0.3630	0.5440	−0.2788	+63	−25
Virginis	5.0	2.04	14.3	9 4.6	8 32.7	+11 16.0	+0.0247	0.5486	0.2747	+43	−42
Virginis	5.2	2.01	14.4	10 17.1	14 30.7	− 6 58.5	−0.4064	0.5529	0.2699	+20	−68
Virginis	6.2	2.00	14.5	9 52.5	15 19.7	− 6 11.3	−1.0302	0.5535	0.2691	−15	−90
Virginis	5.7	1.96	14.5	12 15.9	22 39.2	+ 0 52.5	−0.6195	0.5593	0.2614	+ 8	−84
				NEW	*MOON.*						
G. Ophiuchi	6.3	+2.46	− 9.8	−27 50.8	18 23 35.5	− 2 10.9	−0.1044	0.6106	−0.0022	+ 9	−50
Sagittarii (*var.*)	4.4	2.48	9.6	27 48.1	19 1 7.6	− 0 42.9	−0.1481	0.6101	+0.0032	+ 7	−53
G. Sagittarii	6.2	2.47	9.4	26 56.9	1 27.9	− 0 23.5	−0.9964	0.6099	0.0043	−40	−90
G. Sagittarii	5.7	+2.53	− 9.2	−28 3.3	4 25.2	+ 2 26.1	+0.1329	0.6087	+0.0145	+22	−36

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
210 B. Scorpii	5.8	+2.55	− 9.2	−28 45.2	19 5 7.1	+ 3 6.2	+0.8403	0.6084	+0.0169	+61	+ 6
38 B. Sagittarii	4.7	2.58	8.7	28 28.2	8 32.8	+ 6 23.0	+0.6373	0.6066	0.0286	+55	− 7
C. D.−28° 14268	6.4	2.61	8.5	28 55.4	9 57.4	+ 7 44.0	+1.1348	0.6058	0.0333	+61	+30
48 G. Sagittarii	6.3	2.63	8.3	28 19.2	11 56.8	+ 9 38.3	+0.6046	0.6046	0.0400	+53	− 9
62 B. Sagittarii	6.0	2.64	8.1	28 41.0	11 57.0	+ 9 38.5	+0.9699	0.6046	0.0400	+61	+15
66 B. Sagittarii	4.7	+2.60	− 7.8	−27 4.6	12 12.7	+ 9 53.5	−0.6288	0.6044	+0.0409	−15	−90
58 G. Sagittarii	6.1	2.65	7.8	28 28.3	13 38.5	+11 15.6	+0.8310	0.6035	0.0456	+62	+ 5
68 G. Sagittarii	6.2	2.64	7.2	26 41.3	15 46.9	−10 41.4	−0.8524	0.6021	0.0526	−27	−90
69 G. Sagittarii	6.3	2.65	7.2	26 48.7	15 55.1	−10 33.6	−0.7218	0.6020	0.0531	−19	−90
86 B. Sagittarii	6.5	2.64	7.1	26 38.4	16 14.0	−10 15.4	−0.8778	0.6018	0.0541	−28	−90
φ Sagittarii	3.3	+2.73	− 6.1	−27 4.9	22 27.2	− 4 17.9	−0.0360	0.5970	+0.0739	+19	−46
σ Sagittarii	2.1	2.76	5.4	26 24.4	20 2 5.7	− 0 48.5	−0.4286	0.5939	0.0851	− 1	−72
201 B. Sagittarii	5.9	2.84	4.0	26 3.2	8 59.7	+ 5 48.7	−0.1295	0.5876	0.1054	+17	−51
ψ Sagittarii	4.9	2.84	3.7	25 24.4	9 54.0	+ 6 40.8	−0.6888	0.5867	0.1079	−12	−90
χ Sagittarii	4.9	2.87	2.8	24 40.6	13 43.4	+10 21.1	−0.9999	0.5829	0.1185	−30	−90
51 Sagittarii	5.8	+2.93	− 2.0	−24 54.5	17 59.4	− 9 33.0	−0.2356	0.5785	+0.1298	+14	−58
h Sagittarii	4.7	2.94	2.0	25 4.5	18 15.4	− 9 17.6	−0.0313	0.5782	0.1305	+24	−46
308 B. Sagittarii	6.3	2.99	− 0.9	24 9.4	21 1 24.8	− 2 24.8	+0.0269	0.5706	0.1482	+29	−42
329 B. Sagittarii	6.1	3.00	+ 0.4	22 58.5	4 21.6	+ 0 25.4	−0.7408	0.5674	0.1551	−10	−90
336 B. Sagittarii	6.5	3.01	0.7	22 50.2	5 20.3	+ 1 21.9	−0.7294	0.5663	0.1574	− 9	−90
4 Capricorni	5.7	+3.06	+ 2.0	−22 4.5	11 22.4	+ 7 10.7	−0.5276	0.5597	+0.1704	+ 3	−78
36 B. Capricorni	6.2	3.13	2.7	22 40.6	16 19.5	+11 57.1	+0.9636	0.5543	0.1803	+67	+11
20 Capricorni	6.2	3.20	6.2	19 22.1	22 5 48.4	+ 0 58.0	+0.1160	0.5398	0.2037	+40	−37
21 Capricorni	6.5	3.16	6.8	17 51.9	6 24.3	+ 1 32.7	−1.3351	0.5392	0.2046	−53	−90
θ Capricorni	4.2	3.19	7.2	17 34.4	8 45.0	+ 3 48.6	−1.1586	0.5368	0.2082	−31	−90
114 B. Capricorni	6.1	+3.23	+ 8.0	−17 41.9	13 2.1	+ 7 57.2	−0.1233	0.5325	+0.2142	+29	−51
30 Capricorni	5.4	3.26	8.0	18 20.6	14 22.2	+ 9 14.8	+0.8428	0.5312	0.2160	+72	+ 2
31 Capricorni	6.3	3.25	8.2	17 49.3	14 31.2	+ 9 23.5	+0.3252	0.5310	0.2162	+53	−26
JUPITER	−1.9	. . .	. . .	17 2.8	14 31.4	+ 9 23.7	−0.4889	0.5257	0.2145	+11	−74
ι Capricorni	4.3	3.26	8.7	17 11.9	16 25.3	+11 13.9	+0.0834	0.5292	0.2187	+41	−39
42 Capricorni	5.1	+3.28	+10.9	−14 25.7	23 1 48.8	− 3 40.5	−0.7405	0.5205	+0.2297	0	−90
44 Capricorni	6.0	3.30	11.2	14 47.4	2 33.4	− 2 57.3	−0.1861	0.5199	0.2304	+29	−54
45 Capricorni	5.8	3.31	11.1	15 8.5	3 1.3	− 2 30.3	+0.2931	0.5195	0.2309	+54	−28
151 B. Capricorni	6.1	3.30	12.3	13 7.2	5 51.3	+ 0 14.5	−1.1952	0.5171	0.2338	−30	−90
μ Capricorni	5.2	3.35	12.2	13 57.2	7 38.4	+ 1 58.3	+0.1090	0.5156	0.2354	+45	−38
e Aquarii	5.4	+3.38	+14.2	−11 59.1	16 29.2	+10 33.1	+0.1244	0.5088	+0.2428	+47	−37
167 G. Aquarii	6.3	3.44	17.4	8 20.4	24 7 5.0	+ 0 43.5	−0.1781	0.4994	0.2517	+33	−53
213 B. Aquarii	6.5	3.47	17.6	8 45.4	9 35.9	+ 3 10.1	+0.9072	0.4981	0.2528	+81	+ 4
67 Aquarii	6.4	3.45	18.0	7 24.5	9 42.2	+ 3 16.2	−0.5227	0.4980	0.2528	+16	−75
78 Aquarii	6.3	3.51	18.6	7 39.4	15 50.1	+ 9 13.8	+1.3048	0.4950	0.2552	+82	+35
252 B. Aquarii	5.8	+3.47	+19.5	− 5 26.4	16 10.7	+ 9 33.8	−1.0089	0.4949	+0.2553	−11	−90
197 G. Aquarii	6.3	3.48	19.7	5 15.9	17 19.7	+10 40.8	−0.9065	0.4943	0.2556	− 5	−90
263 B. Aquarii	6.1	3.50	19.9	5 10.1	19 38.8	−11 3.9	−0.4178	0.4934	0.2562	+22	−68
293 B. Aquarii	5.5	3.56	21.1	3 57.6	25 3 23.6	− 3 31.8	+0.2597	0.4905	0.2579	+58	−30
316 B. Aquarii	6.5	3.60	21.1	4 22.9	5 59.0	− 1 0.7	+1.3891	0.4897	0.2582	+86	+45
13 Piscium	6.4	+3.61	+22.8	− 1 33.3	12 32.0	+ 5 21.7	−0.0027	0.4881	+0.2586	+44	−44
14 Piscium	5.9	3.63	22.8	− 1 43.0	13 45.4	+ 6 33.1	+0.4904	0.4878	0.2586	+73	−19
21 Piscium	5.6	3.68	24.2	+ 0 36.3	22 22.4	− 9 3.8	+0.1758	0.4865	0.2581	+53	−35
25 Piscium	6.2	3.68	24.7	1 37.2	26 0 24.9	− 7 4.6	−0.4106	0.4863	0.2578	+23	−67
51 Piscium	5.6	3.87	27.2	6 29.3	22 36.6	− 9 28.6	−0.1162	0.4871	0.2510	+38	−49
101 Piscium	6.2	+4.23	+29.1	+14 13.8	28 9 38.5	+ 0 35.9	−0.2850	0.4979	+0.2262	+29	−54
4 Arietis	5.8	4.32	29.3	16 32.2	16 16.8	+ 7 2.9	−1.3671	0.5010	0.2194	−50	−73
ι Arietis	5.1	4.39	29.2	17 24.4	21 8.6	+11 46.4	−1.2809	0.5035	0.2139	−36	−73
35 B. Arietis	6.4	4.43	29.0	17 50.9	29 0 29.4	− 8 58.6	−1.0629	0.5053	0.2100	−17	−72
47 B. Arietis	6.5	4.44	28.8	17 37.7	2 37.0	− 6 54.7	−0.3744	0.5065	0.2073	+24	−56
20 H¹. Arietis	6.4	+4.46	+28.5	+16 49.8	3 27.8	6 5.3	+0.6885	0.5070	+0.2063	+90	− 1

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
Arietis	6.2	+4.61	+28.1	+19 28.9	29 14 23.7	+ 4 31.2	−0.0831	0.5133	+0.1915	+39	−38
Arietis	5.7	4.67	27.5	19 39.2	20 19.7	+10 16.4	+0.8367	0.5169	0.1826	+90	+11
Arietis (*mean*)	4.6	4.78	26.6	21 0.3	30 4 41.8	− 5 36.9	+0.8081	0.5221	0.1691	+90	+11
Arietis	5.8	4.99	25.1	24 25.6	16 50.4	+ 6 8.8	−1.0670	0.5296	0.1472	−20	−66
Tauri	5.9	5.03	24.2	24 11.0	21 40.4	+10 49.5	−0.1072	0.5326	0.1379	+38	−33

DECEMBER.

Tauri	6.1	+5.09	+23.8	+25 3.5	1 0 39.0	−10 17.8	−0.6758	0.5344	+0.1319	+ 6	−64
Tauri	5.4	5.07	23.3	24 1.6	2 33.6	− 8 27.0	+0.7165	0.5356	0.1280	+90	+11
Tauri	3.8	+5.07	+23.3	+23 51.0	2 35.8	− 8 24.8	+0.9160	0.5356	+0.1279	+90	+23
Tauri	5.6	5.09	23.3	24 34.6	2 43.1	− 8 17.8	+0.1269	0.5357	0.1277	+51	−20
Tauri	4.3	5.08	23.3	24 12.3	2 44.8	− 8 16.2	+0.5424	0.5358	0.1276	+81	+ 1
Tauri	4.1	5.08	23.2	24 6.4	3 2.3	− 7 59.2	+0.6887	0.5358	0.1270	+90	+ 9
Tauri	5.8	5.09	23.2	24 17.6	3 4.4	− 7 57.2	+0.4859	0.5359	0.1269	+76	− 2
Tauri	6.5	+5.09	+23.2	+24 16.0	3 8.3	− 7 53.4	+0.5236	0.5359	+0 1268	+79	0
Tauri	4.3	5.07	23.1	23 41.3	3 16.7	− 7 45.3	+1.1829	0.5360	0.1265	+90	+43
Tauri	3.0	5.08	23.0	23 50.8	3 49.1	− 7 14.0	+1.0749	0.5363	0.1254	+90	+34
Tauri	3.7	5.09	22.9	23 47.9	4 36.2	− 6 28.3	+1.2265	0.5368	0.1237	+90	+48
Tauri	5.2	5.09	22.9	23 52.9	4 36.8	− 6 27.8	+1.1352	0.5368	0.1237	+90	+39
H. Tauri	5.3	+5.14	+22.8	+25 19.6	5 7.0	− 5 58.6	−0.4042	0.5370	+0.1226	+21	−48
Tauri	5.6	5.25	20.9	26 15.8	14 34.8	+ 3 10.3	−0.3750	0.5423	0.1020	+23	−44
Tauri	5.0	5.31	19.9	27 9.1	18 54.3	+ 7 21.0	−0.9361	0.5445	0.0922	−12	−63
Tauri	5.3	5.27	19.6	25 26.0	19 56.6	+ 8 21.3	+1.0574	0.5450	0.0898	+90	+37
B. Aurigæ	6.0	5.44	16.2	27 45.5	2 9 26.5	− 2 36.7	−0.5144	0.5508	0.0574	+14	−48
B. Aurigæ	6.5	+5.45	+14.8	+27 34.8	14 41.2	+ 2 27.1	−0.0511	0.5526	+0.0443	+41	−21
B. Aurigæ	6.0	5.49	14.2	27 55.6	16 56.0	+ 4 37.2	−0.3387	0.5533	0.0386	+24	−36
B. Tauri	6.4	5.49	12.8	27 52.5	21 52.2	+ 9 22.9	−0.1217	0.5546	0.0259	+37	−23
Aurigæ	6.4	5.54	12.4	28 51.5	22 53.9	+10 22.5	−1.1779	0.5548	0.0233	−36	−61
Tauri	1.8	5.53	11.9	28 32.3	3 0 10.6	+11 36.4	−0.7985	0.5551	0.0200	− 3	−61
B. Aurigæ	6.5	+5.49	+10.8	+27 36.6	4 24.1	− 8 19.1	+0.2829	0.5558	+0.0090	+61	0
B. Aurigæ	5.7	5.46	10.8	26 52.5	4 56.8	− 7 47.6	+1.0943	0.5560	+0.0076	+90	+47
B. Tauri	5.6	5.52	8.9	27 56.7	10 56.6	− 2 0.5	−0.0821	0.5567	−0.0081	+39	−19
Tauri	4.6	5.50	8.6	27 35.7	11 58.5	− 1 0.8	+0.2918	0.5568	0.0108	+62	0
B. Aurigæ	6.4	5.56	8.1	28 55.9	13 21.4	+ 0 19.1	−1.1888	0.5569	0.0145	−37	−61
B. Tauri	6.1	+5.50	+ 7.6	+27 34.3	15 18.8	+ 2 12.3	+0.2675	0.5569	−0.0195	+60	− 2
Aurigæ	5.1	5.49	3.0	28 5.5	4 6 9.8	− 7 28.4	−0.8780	0.5561	0.0583	− 8	−62
Aurigæ	5.8	5.50	2.3	28 20.4	8 3.3	− 5 38.9	−1.2639	0.5558	0.0631	−51	−62
Geminorum	6.2	5.35	+ 0.2	26 11.7	16 30.6	+ 2 30.4	+0.4453	0.5541	0.0846	+73	+ 1
Geminorum	6.3	5.35	0.0	26 1.9	16 48.1	+ 2 47.4	+0.5976	0.5541	0.0853	+87	+ 9
Geminorum	5.6	+5.36	− 1.8	+26 59.9	22 1.5	+ 7 49.7	−0.9299	0.5526	−0.0982	−11	−63
Geminorum	6.1	5.27	1.9	25 2.1	23 31.0	+ 9 16.1	+1.0484	0.5522	0.1018	+90	+35
B. Geminorum	6.5	5.35	2.6	26 50.7	5 0 31.7	+10 14.6	−1.0160	0.5519	0.1043	−18	−63
Geminorum	5.1	5.24	3.0	25 13.0	3 24.0	−10 59.2	+0.4377	0.5510	0.1112	+72	− 2
B. Geminorum	6.3	5.17	4.8	24 33.1	9 58.8	− 4 38.1	+0.3715	0.5486	0.1266	+67	− 7
B. Geminorum	6.0	+5.16	− 4.9	+24 25.0	10 24.7	− 4 13.1	+0.4630	0.5484	−0.1276	+74	− 3
Geminorum	3.7	5.15	5.6	24 36.2	12 45.6	− 1 57.0	−0.0446	0.5476	0.1329	+41	−29
Geminorum	6.3	5.08	5.9	23 21.2	14 37.5	− 0 9.0	+1.0512	0.5468	0.1371	+90	+31
B. Cancri	6.4	5.05	7.6	23 49.1	20 14.4	+ 5 16.3	−0.2552	0.5445	0.1494	+30	−42
Cancri	6.2	4.99	8.0	22 52.8	22 39.4	+ 7 36.4	+0.3863	0.5435	0.1546	+68	− 9
B. Cancri	6.4	+4.97	− 9.0	+23 23.7	6 2 1.3	+10 51.5	−0.6987	0.5420	−0.1616	+ 5	−66
Cancri	5.5	4.77	10.6	20 43.9	10 48.8	− 4 38.6	+0.6563	0.5382	0.1791	+90	+ 2
Cancri	6.5	4.72	11.4	20 18.5	14 15.4	− 1 18.9	+0.4787	0.5366	0.1855	+74	− 8
Cancri	6.5	4.72	11.3	20 16.4	14 17.8	− 1 16.6	+0.5100	0.5366	0.1856	+77	− 7
B. Cancri	6.5	4.71	11.3	19 58.3	14 23.0	− 1 11.5	+0.8155	0.5366	0.1858	+90	+10
Cancri	6.3	+4.71	−11.3	+19 50.8	14 25.4	− 1 9.2	+0.9414	0.5366	−0.1858	+90	+18

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limit ing Pa allels	
Name.	Mag.	Red'ns from 1914.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
139 B. Cancri	6.1	+4.63	−12.2	+19 9.0	6 19 15.1	+ 3 31.0	+0.7638	0.5344	−0.1945	+90	+
12 B. Leonis	6.3	4.36	15.3	16 57.2	7 11 49.5	− 4 27.0	−0.3569	0.5276	0.2212	+25	−
7 Leonis	6.2	4.24	15.6	14 45.6	16 50.2	+ 0 24.2	+0.8336	0.5258	0.2283	+90	+
11 Leonis	6.5	4.22	15.9	14 43.9	17 52.5	+ 1 24.5	+0.6245	0.5255	0.2297	+85	−
ψ Leonis	5.6	4.19	16.2	14 24.7	20 38.9	+ 4 5.7	+0.3203	0.5246	0.2334	+62	−
ν Leonis	5.0	+4.06	−17.1	+12 51.0	8 3 44.4	+10 57.7	+0.2741	0.5225	−0.2421	+59	−
α Leonis	1.3	3.97	17.8	12 23.0	8 44.4	− 8 11.7	−0.4599	0.5212	0.2477	+20	−
44 Leonis	5.9	3.82	18.1	9 13.0	17 5.2	− 0 6.4	+0.7463	0.5197	0.2559	+90	−
45 Leonis	5.8	3.82	18.6	10 11.8	18 15.9	+ 1 2.1	−0.5770	0.5195	0.2570	+14	−
ρ Leonis	3.8	3.78	18.8	9 44.7	20 49.6	+ 3 31.1	−0.7667	0.5192	0.2592	+ 4	−
48 Leonis	5.2	+3.72	−18.1	+ 7 23.5	21 49.9	+ 4 29.5	+1.4214	0.5190	−0.2600	+90	+
49 Leonis	5.7	3.75	18.7	9 5.4	21 56.2	+ 4 35.6	−0.3732	0.5190	0.2601	+24	−
37 Sextantis	6.3	3.65	18.8	6 49.3	9 3 26.2	+ 9 55.5	+0.5416	0.5186	0.2643	+77	−
56 Leonis	6.1	3.59	19.3	6 38.4	8 22.2	− 9 17.6	−0.5819	0.5185	0.2676	+14	−
c Leonis	5.1	3.56	19.6	6 33.5	10 43.0	− 7 1.1	−1.1268	0.5186	0.2690	−19	−
75 Leonis	5.4	+3.40	−19.3	+ 2 28.7	18 55.8	+ 0 56.4	+0.8563	0.5193	−0.2730	+90	+
76 Leonis	6.0	3.39	19.1	2 7.0	19 44.4	+ 1 43.4	+1.0067	0.5194	0.2733	+90	+
79 Leonis	5.5	3.36	19.3	+ 1 52.5	22 16.4	+ 4 10.8	+0.5613	0.5198	0.2742	+78	−
υ Leonis	4.5	3.26	19.1	− 0 21.2	10 4 38.3	+10 20.8	+1.0938	0.5211	0.2760	+90	+
9 B. Virginis	6.2	3.19	19.9	+ 0 9.2	10 33.7	− 7 55.0	−1.0633	0.5227	0.2768	−14	−
31 B. Virginis	6.4	+3.13	−19.9	− 1 17.6	16 23.8	− 2 15.9	−1.1999	0.5248	−0.2769	−24	−
78 B. Virginis	6.5	3.03	18.8	5 14.8	22 46.4	+ 3 54.5	+1.0562	0.5276	0.2760	+85	+
χ Virginis	4.8	2.90	19.0	7 31.7	11 10 36.6	− 8 38.3	+0.1159	0.5339	0.2719	+48	−
ψ Virginis	5.0	2.84	18.8	9 4.6	17 37.0	− 1 51.7	−0.2134	0.5384	0.2677	+31	−
49 Virginis	5.2	2.79	18.6	10 17.2	23 47.7	+ 4 6.5	−0.6377	0.5429	0.2629	+ 8	−
50 Virginis	6.2	+2.78	−18.8	− 9 52.6	12 0 38.3	+ 4 55.3	−1.2703	0.5435	−0.2622	−34	−
i Virginis	5.7	2.71	18.2	12 15.9	8 13.0	−11 45.7	−0.8334	0.5495	0.2546	− 4	−
75 Virginis	5.6	2.69	17.4	14 55.5	10 54.2	− 9 10.1	+1.1446	0.5518	0.2515	+75	+
550 B. Virginis	6.0	2.69	18.1	12 46.7	11 42.5	− 8 23.5	−1.2016	0.5525	0.2505	−30	−
83 Virginis	5.6	2.66	17.3	15 45.1	15 57.5	− 4 17.6	+0.7117	0.5562	0.2451	+74	−
85 Virginis	6.1	+2.66	−17.4	−15 20.4	16 26.0	− 3 50.1	+0.1857	0.5566	−0.2444	+48	−
214 G. Virginis	6.5	2.61	17.3	15 55.8	13 0 47.2	+ 4 12.9	−1.2181	0.5642	0.2319	−35	−
43 H. Virginis	5.5	2.59	16.8	17 48.3	5 0.9	+ 8 17.2	−0.3199	0.5681	0.2246	+19	−
231 G. Virginis	6.4	2.59	16.6	18 11.4	5 41.9	+ 8 56.7	−0.0895	0.5688	0.2234	+31	−
236 G. Virginis	5.7	2.58	16.6	18 19.4	6 20.9	+ 9 34.2	−0.1038	0.5694	0.2222	+30	−
9 G. Libræ	6.5	+2.57	−16.1	−20 4.0	12 56.5	− 8 5.2	+0.2015	0.5756	−0.2094	+44	−
17 G. Libræ	6.4	2.54	15.9	20 49.0	17 28.8	− 3 43.4	+0.0146	0.5800	0.1998	+33	−
18 G. Libræ	6.1	2.55	15.8	20 58.1	17 53.5	− 3 19.8	+0.0836	0.5803	0.1989	+37	−
43 B. Libræ	5.7	2.61	17.1	21 2.0	21 53.5	+ 0 30.8	−0.6300	0.5841	0.1898	− 1	−
47 G. Libræ	6.1	2.54	15.3	21 42.1	14 1 25.8	+ 3 54.6	−0.6252	0.5873	0.1813	− 2	−
64 G. Libræ	5.8	+2.52	−15.0	−22 5.2	5 15.7	+ 7 35.3	−0.9218	0.5907	−0.1715	−20	−
				NEW	*MOON.*						
308 B. Sagittarii	6.3	+2.88	− 0.4	−24 9.4	18 11 47.4	+ 9 46.0	+0.2222	0.5786	+0.1523	+39	−
329 B. Sagittarii	6.1	2.88	+ 0.8	22 58.5	14 40.2	−11 27.8	−0.5306	0.5755	0.1593	+ 2	−
336 B. Sagittarii	6.5	+2.88	+ 1.0	−22 50.2	15 37.5	−10 32.7	−0.5171	0.5744	+0.1615	+ 2	−
4 Capricorni	5.7	2.91	2.1	22 4.5	21 31.0	− 4 52.6	−0.3038	0.5681	0.1748	+15	−
36 B. Capricorni	6.2	2.96	2.8	22 40.6	19 2 20.7	− 0 13.6	+1.1805	0.5628	0.1848	+67	+
Uranus	6.0	. . .	. . .	18 33.1	12 17.0	+ 9 21.2	−1.1304	0.5500	0.2026	−30	−
19 Capricorni	5.7	2.94	5.6	18 14.9	13 21.4	+10 23.4	−1.2246	0.5507	0.2049	−38	−
20 Capricorni	6.2	+2.98	+ 5.8	−19 22.1	15 28.7	−11 33.8	+0.3695	0.5484	+0.2084	+54	−
21 Capricorni	6.5	2.95	6.3	17 51.9	16 3.6	−11 0.1	−1.0624	0.5478	0.2093	−24	−
θ Capricorni	4.2	2.97	6.7	17 34.4	18 20.6	− 8 47.8	−0.8838	0.5453	0.2128	−11	−
114 B. Capricorni	6.1	3.00	7.4	17 42.0	22 30.8	− 4 46.1	+0.1461	0.5409	0.2189	+43	−
30 Capricorni	5.4	3.02	7.4	18 20.6	23 48.8	− 3 30.7	+1.1022	0.5396	0.2207	+72	+
31 Capricorni	6.3	+3.02	+ 7.6	−17 49.3	23 57.5	− 3 22.3	+0.5915	0.5394	+0.2209	+68	−

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
Capricorni	4.3	+3.01	+ 8.0	−17 12.0	**20** 1 48.5	− 1 34.9	+0.3559	0.5376	+0.2234	+55	−25
JUPITER	−1.7	. . .	. . .	15 36.7	8 24.5	+ 4 48.1	+0.2032	0.5234	0.2288	+48	−33
Capricorni	5.1	3.02	9.9	14 25.7	10 57.0	+ 7 15.7	−0.4429	0.5286	0.2342	+16	−70
Capricorni	6.0	3.04	10.2	14 47.4	11 40.4	+ 7 57.7	+0.1056	0.5280	0.2350	+44	−38
Capricorni	5.8	3.05	10.1	15 8.5	12 7.5	+ 8 23.9	+0.5792	0.5275	0.2354	+70	−14
B. Capricorni	6.1	+3.03	+11.2	−13 7.3	14 53.0	+11 4.1	−0.8863	0.5250	+0.2382	− 8	−90
Capricorni	5.2	3.08	11.2	13 57.2	16 37.3	−11 14.9	+0.4038	0.5234	0.2399	+61	−23
Aquarii	5.4	3.10	12.9	11 59.1	**21** 1 14.4	− 2 53.8	+0.4296	0.5161	0.2470	+64	−22
G. Aquarii	6.3	3.16	15.9	8 20.4	15 28.8	+10 55.1	+0.1440	0.5058	0.2552	+50	−36
B. Aquarii	6.5	3.19	16.0	8 45.4	17 56.3	−10 41.7	+1.2185	0.5043	0.2562	+81	+26
Aquarii	6.4	+3.17	+16.5	− 7 24.5	18 2.4	−10 35.7	−0.1951	0.5042	+0.2563	+32	−54
B. Aquarii	5.8	3.19	17.8	5 26.5	**22** 0 22.2	− 4 26.9	−0.6727	0.5006	0.2584	+ 8	−88
G. Aquarii	6.3	3.20	18.0	5 15.9	1 29.8	− 3 21.3	−0.5710	0.5000	0.2586	+14	−79
B. Aquarii	6.1	3.22	18.2	5 10.1	3 45.9	− 1 9.0	−0.0868	0.4988	0.2592	+38	−48
B. Aquarii	5.5	3.27	19.4	3 57.6	11 21.3	+ 6 13.6	+0.5855	0.4953	0.2603	+79	−14
Piscium	6.4	+3.33	+21.0	− 1 33.3	20 19.6	− 9 3.1	+0.3258	0.4922	+0.2605	+62	−27
Piscium	5.9	3.35	21.1	− 1 43.0	21 31.7	− 7 53.0	+0.8143	0.4918	0.2604	+88	− 1
Piscium	4.6	3.34	22.3	+ 1 18.8	**23** 1 54.4	− 3 37.4	−1.3340	0.4908	0.2600	−37	−89
Piscium	5.6	3.40	22.5	0 36.3	6 0.5	+ 0 22.0	+0.5001	0.4898	0.2594	+74	−18
Piscium	5.8	3.40	23.2	2 27.5	7 24.0	+ 1 43.2	−1.1573	0.4896	0.2591	−21	−88
Piscium	6.2	+3.41	+23.0	+ 1 37.1	8 1.2	+ 2 19.4	−0.0824	0.4895	+0.2589	+40	−48
Piscium	5.6	3.62	25.8	6 29.3	**24** 5 56.8	− 0 20.7	+0.1928	0.4886	0.2508	+54	−33
B. Piscium	6.5	3.66	26.7	8 53.6	10 51.1	+ 4 25.6	−1.2281	0.4891	0.2480	−27	−81
Piscium	3.7	4.03	28.9	14 54.7	**25** 14 26.7	+ 7 15.7	−1.3023	0.4965	0.2267	−37	−75
Piscium	6.2	4.06	28.5	14 13.8	16 46.0	+ 9 31.1	−0.0253	0.4974	0.2244	+42	−40
Arietis	5.8	+4.16	+29.0	+16 32.2	23 23.3	− 8 3.0	−1.1166	0.5003	+0.2174	−20	−73
Arietis	5.1	4.24	28.9	17 24.4	**26** 4 14.4	− 3 20.2	−1.0399	0.5027	0.2119	−15	−73
B. Arietis	6.4	4.29	28.9	17 50.9	7 34.9	− 0 5.6	−0.8290	0.5044	0.2078	− 1	−72
B. Arietis	6.5	4.32	28.7	17 37.7	9 42.3	+ 1 58.2	−0.1462	0.5054	0.2052	+36	−43
H¹. Arietis	6.4	4.34	28.2	16 49.8	10 33.0	+ 2 47.4	+0.9127	0.5059	0.2041	+90	+12
Arietis	5.6	+4.43	+28.8	+19 30.7	15 3.8	+ 7 10.3	−1.1545	0.5084	+0.1982	−25	−70
Arietis	6.2	4.53	28.2	19 28.9	21 28.3	−10 36.7	+0.1204	0.5121	0.1892	+51	−28
Arietis	5.7	4.61	27.6	19 39.2	**27** 3 24.1	− 4 51.5	+1.0259	0.5158	0.1803	+90	+23
Arietis (*mean*)	4.6	4.76	26.9	21 0.3	11 45.9	+ 3 14.8	+0.9793	0.5210	0.1667	+90	+22
Arietis	5.8	5.02	25.9	24 25.6	23 53.9	− 9 0.1	−0.9195	0.5288	0.1449	− 9	−66
Tauri	5.9	+5.09	+25.0	+24 11.0	**28** 4 43.6	− 4 19.7	+0.0279	0.5319	+0.1356	+45	−26
Tauri	6.1	5.16	24.7	25 3.5	7 41.9	− 1 27.2	−0.5464	0.5338	0.1296	+13	−57
Tauri	5.4	5.16	24.0	24 1.6	9 36.3	+ 0 23.4	+0.8389	0.5350	0.1257	+90	+18
Tauri	3.8	5.15	24.0	23 51.0	9 38.5	+ 0 25.5	+1.0381	0.5350	0.1256	+90	+31
Tauri	5.6	5.17	24.1	24 34.6	9 45.8	+ 0 32.6	+0.2501	0.5350	0.1254	+59	−14
Tauri	4.3	+5.16	+24.1	+24 12.3	9 47.4	+ 0 34.1	+0.6647	0.5351	+0.1253	+90	+ 8
Tauri	4.1	5.16	24.0	24 6.4	10 4.9	+ 0 51.1	+0.8101	0.5352	0.1247	+90	+16
Tauri	5.8	5.17	24.0	24 17.6	10 7.0	+ 0 53.1	+0.6076	0.5352	0.1246	+87	+ 5
Tauri	6.5	5.17	24.0	24 16.0	10 11.0	+ 0 57.0	+0.6451	0.5353	0.1245	+90	+ 7
Tauri	4.3	5.16	23.8	23 41.3	10 19.3	+ 1 5.0	+1.3028	0.5354	0.1242	+90	+61
Tauri	3.0	+5.17	+23.8	+23 50.8	10 51.6	+ 1 36.2	+1.1938	0.5357	+0.1231	+90	+45
Tauri	5.2	5.18	23.6	23 52.9	11 39.2	+ 2 22.2	+1.2522	0.5363	0.1214	+90	+51
H. Tauri	5.3	5.23	23.8	25 19.6	12 9.4	+ 2 51.5	−0.2853	0.5366	0.1204	+28	−41
Tauri	5.6	5.40	21.9	26 15.8	21 35.9	+11 59.0	−0.2775	0.5422	0.0998	+28	−38
Tauri	5.0	5.49	21.0	27 9.1	**29** 1 54.6	− 7 51.1	−0.8470	0.5446	0.0900	− 6	−63
Tauri	5.3	+5.45	+20.5	+25 26.0	2 56.7	− 6 51.0	+1.1391	0.5452	+0.0876	+90	+43
B. Aurigæ	6.0	5.70	17.3	27 45.6	16 23.1	+ 6 7.5	−0.4589	0.5516	0.0552	+18	−45
B. Aurigæ	6.5	5.75	15.8	27 34.9	21 36.1	+11 9.5	−0.0089	0.5539	0.0421	+43	−18
B. Aurigæ	6.0	5.79	15.3	27 55.6	23 50.1	−10 41.2	−0.3005	0.5547	0.0364	+26	−34
B. Tauri	6.4	5.84	13.7	27 52.5	**30** 4 44.5	− 5 57.2	−0.0952	0.5562	0.0238	+38	−21
Aurigæ	6.4	+5.89	+13.5	+28 51.6	5 45.7	− 4 58.2	−1.1499	0.5565	+0.0211	−33	−61

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.				
Name.	Mag.	Red'ns from 1914.0. Δα	Red'ns from 1914.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′
		s	″	° ′	d h m	h m			
β Tauri	1.8	+5.89	+12.9	+28 32.4	30 7 1.9	− 3 44.7	−0.7747	0.5569	+0.0178
107 B. Aurigæ	6.5	5.88	11.6	27 36.6	11 13.5	+ 0 17.9	+0.2933	0.5579	0.0068
112 B. Aurigæ	5.7	5.85	11.4	26 52.5	11 45.9	+ 0 49.1	+1.1002	0.5581	+0.0054
406 B. Tauri	5.6	5.94	9.6	27 56.7	17 42.8	+ 6 33.3	−0.0849	0.5591	−0.0104
136 Tauri	4.6	5.94	9.2	27 35.7	18 44.2	+ 7 32.5	+0.2852	0.5593	0.0131
154 B. Aurigæ	6.4	+6.01	+ 8.9	+28 55.9	20 6.3	+ 8 51.6	−1.1920	0.5594	−0.0167
415 B. Tauri	6.1	5.95	8.2	27 34.3	22 2.7	+10 43.8	+0.2536	0.5596	0.0219
49 Aurigæ	5.1	+6.04	+ 3.2	+28 5.5	31 12 44.8	+ 0 54.1	−0.9188	0.5596	−0.0608

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1914.

Date.	The Star's		Immersion.				Emersion.			
			Washington.		Angle from—		Washington.		Angle from—	
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.
			h m	h m	°	°	h m	h m	°	°
Jan. 1	81 Aquarii	6.4	1 0	6 17	47	17	2 16	7 33	234	192
1	82 Aquarii	6.4	2 41	7 57	347	303	3 10	8 27	299	252
6	μ Arietis	5.7	2 18	7 16	39	50	3 42	8 39	258	225
7	16 Tauri	5.4	9 4	13 56	119	62	9 54	14 46	228	175
7	q Tauri	4.3	9 12	14 4	79	23	10 12	15 3	268	216
7	20 Tauri	4.1	9 30	14 22	105	50	10 24	15 16	243	192
7	21 Tauri	5.8	9 34	14 26	63	8	10 28	15 20	285	235
7	22 Tauri	6.5	9 37	14 29	70	15	10 32	15 24	278	228
10	49 Aurigæ	5.1	5 19	10 0	43	93	6 12	10 52	326	345
12	γ Cancri	4.7	8 58	13 30	60	46	9 36	14 9	0	327
13	8 Leonis	5.9	6 47	11 15	106	157	8 1	12 29	311	349
15	83 Leonis	6.3	9 10	13 31	87	123	10 5	14 26	352	16
15	τ Leonis	5.2	10 2	14 22	68	93	10 36	14 57	14	29
17	49 Virginis	5.2	9 4	13 17	160	204	9 56	14 9	272	311
20	π Scorpii	3.0	11 40	15 41	95	139	12 42	16 42	315	351
Feb. 5	38 B. Aurigæ	6.5	5 30	8 29	143	114	6 17	9 15	206	156
5	47 B. Aurigæ	6.0	8 20	11 18	66	3	9 23	12 21	301	240
7	47 Geminorum	5.6	8 13	11 4	82	35	9 23	12 13	315	256
8	35 B. Cancri	6.4	9 34	12 20	174	129	10 14	13 0	239	186
9	12 B. Leonis ‡	6.3	16 2	18 43	155	105	16 39	19 20	255	208
11	c Leonis	5.1	7 29	10 4	160	207	8 23	10 57	266	308
12	9 B. Virginis †	6.2	5 14	7 45	152	203	5 58	8 29	264	315
13	ψ Virginis	5.0	12 39	15 5	149	152	13 49	16 15	291	275
17	135 B. Scorpii	6.0	13 56	16 6	130	162	15 8	17 18	267	286
Mar. 1	20 H¹. Arietis	6.4	6 24	7 48	61	6	7 33	8 57	259	205
3	18 Tauri	5.6	4 47	6 3	84	41	6 14	7 31	245	187
5	406 B. Tauri	5.6	12 19	13 27	109	57	13 11	14 18	268	221
6	49 Aurigæ	5.1	4 12	5 17	77	138	5 34	6 38	286	332
8	γ Cancri	4.7	9 51	10 47	47	8	10 12	11 8	14	330
9	8 Leonis	5.9	7 19	8 11	100	147	8 30	9 22	321	350

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.

† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1914.

te.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
. 11	83 Leonis	6.3	7 27	8 12	85	134	8 17	9 2	345	28	0 50
11	τ Leonis	5.2	8 7	8 51	77	122	8 50	9 35	357	36	0 44
14	43 H. Virginis	5.5	9 35	10 7	83	130	10 21	10 54	342	24	0 46
14	231 G. Virginis	6.4	10 26	10 59	110	152	11 29	12 1	317	350	1 2
14	236 G. Virginis	5.7	11 16	11 48	88	123	12 10	12 42	341	8	0 55
19	248 B. Sagittarii	5.7	16 36	16 47	40	73	17 37	17 49	304	326	1 2
29	μ Arietis	5.7	7 37	7 11	129	73	8 16	7 49	202	148	0 39
. 1	354 B. Tauri	6.4	8 23	7 45	127	65	9 26	8 48	243	182	1 3
3	134 B. Geminorum	6.5	8 29	7 43	59	8	9 19	8 33	342	284	0 50
7	c Leonis	5.1	9 16	8 14	127	158	10 30	9 28	311	321	1 14
9	ψ Virginis	5.0	13 9	11 59	134	129	14 21	13 11	302	280	1 12
11	17 G. Libræ	6.4	10 26	9 8	105	150	11 25	10 7	316	354	0 59
11	18 G. Libræ	6.1	10 56	9 38	107	149	11 58	10 40	315	348	1 2
12	b Scorpii	4.7	11 42	10 20	86	130	12 38	11 16	324	0	0 56
12	4 Scorpii	5.7	13 58	12 36	96	119	15 11	13 48	310	319	1 12
18	δ Capricorni	3.0	17 11	15 25	19	66	17 59	16 12	296	338	0 48
19	58 Aquarii	6.4	17 6	15 15	14	64	17 47	15 56	297	345	0 41
28	38 B. Aurigæ	6.5	8 56	6 32	78	17	10 2	7 38	289	230	1 6
1	5 B. Cancri	6.4	12 24	9 47	139	81	13 18	10 42	270	213	0 55
8	43 H. Virginis	5.5	10 59	7 55	63	101	11 31	8 27	4	37	0 32
8	231 G. Virginis	6.4	11 50	8 46	94	124	12 50	9 46	335	354	1 0
8	236 G. Virginis	5.7	12 50	9 46	63	82	13 26	10 22	5	16	0 36
10	τ Scorpii	2.9	18 57	15 44	133	104	19 53	16 40	235	197	0 56
16	42 Aquarii	5.5	17 19	13 42	91	140	18 23	14 46	217	260	1 4
17	81 Aquarii	6.4	17 56	14 15	51	101	19 4	15 24	251	296	1 9
28	κ Geminorum	3.7	12 28	8 5	119	61	13 26	9 3	285	230	0 58
e 3	ψ Virginis	5.0	11 6	6 20	130	155	12 20	7 33	309	317	1 13
6	b Scorpii	4.7	12 13	7 15	91	131	13 14	8 16	318	348	1 1
6	4 Scorpii	5.7	14 35	9 36	104	120	15 52	10 54	298	298	1 17
8	C. D.–28° 14268	6.4	17 27	12 20	69	77	18 47	13 40	284	275	1 19
8	62 B. Sagittarii	6.0	20 34	15 27	49	20	21 37	16 29	286	248	1 2
11	η Capricorni †	4.8	15 43	10 24	27	77	16 27	11 8	302	349	0 44
30	χ Virginis	4.8	12 46	6 13	119	116	14 1	7 28	319	297	1 15
y 4	τ Scorpii	2.9	16 42	9 53	125	122	17 56	11 7	255	237	1 14
8	17 Capricorni	5.8	19 6	12 1	67	87	20 30	13 24	240	243	1 24
15	20 H¹. Arietis	6.4	22 50	15 16	38	91	0 3	16 29	251	296	1 13
17	16 Tauri	5.4	21 15	13 34	85	137	22 10	14 29	231	287	0 54
17	17 Tauri	3.8	21 29	13 48	142	195	21 44	14 4	173	227	0 15
17	q Tauri	4.3	21 32	13 51	54	107	22 28	14 47	261	318	0 56
17	20 Tauri	4.1	21 43	14 2	87	141	22 39	14 58	227	284	0 55
17	21 Tauri	5.8	21 53	14 12	49	103	22 50	15 9	265	323	0 57
17	22 Tauri	6.5	21 54	14 13	57	112	22 53	15 12	256	314	0 59
19	107 B. Aurigæ	6.5	21 57	14 8	76	122	22 48	14 59	265	316	0 51
25	37 Sextantis	6.3	15 33	7 22	164	112	16 17	8 5	260	208	0 43
g. 4	36 B. Capricorni	6.2	23 33	14 41	46	10	0 37	15 45	255	210	1 4
7	λ Aquarii	3.8	20 0	10 57	62	99	21 20	12 17	224	246	1 20
7	78 Aquarii	6.3	21 39	12 35	61	80	23 0	13 57	217	214	1 21
30	τ Sagittarii	3.5	19 39	9 5	90	82	20 56	10 22	232	209	1 17

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.

† Immersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1914.

Date.	The Star's		Immersion.				Emersion.			
			Washington.		Angle from—		Washington.		Angle from—	
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.
			h m	h m	°	°	h m	h m	°	°
Sept. 3	σ Aquarii	4.9	17 3	6 14	123	174	17 37	6 48	185	233
3	213 B. Aquarii	6.5	2 30	15 40	81	36	3 28	16 38	211	162
4	316 B. Aquarii	6.5	20 28	9 35	66	104	21 46	10 53	216	240
9	ε Arietis (*mean*) †	4.6	19 4	7 51	77	121	19 54	8 41	239	288
12	406 B. Tauri	5.6	1 20	13 54	95	156	2 30	15 4	246	309
14	κ Geminorum	3.7	1 42	14 9	153	208	2 14	14 40	217	273
Oct. 1	82 Aquarii	6.4	18 35	5 55	127	174	19 1	6 21	169	214
6	μ Arietis †	5.7	19 7	6 8	52	99	19 57	6 58	260	311
7	18 Tauri	5.6	2 46	13 42	75	111	4 18	15 14	241	213
14	α Leonis	1.3	5 7	15 35	99	152	6 10	16 37	312	4
25	36 B. Capricorni	6.2	23 0	8 46	81	49	0 5	9 50	220	179
26	30 Capricorni	5.4	21 21	7 3	358	356	22 5	7 47	295	283
Nov. 5	354 B. Tauri	6.4	7 29	16 30	32	331	8 6	17 7	338	276
6	415 B. Tauri	6.1	22 52	7 50	43	92	23 34	8 32	302	355
7	39 Geminorum	6.2	0 10	9 4	130	180	0 53	9 48	229	284
8	5 B. Cancri	6.4	4 6	12 56	54	113	4 59	13 48	329	27
11	49 Leonis	5.7	4 34	13 12	53	105	5 2	13 40	357	49
19	210 B. Scorpii ‡	5.8	21 39	5 47	110	69	22 32	6 39	227	179
30	ε Arietis (*mean*) †	4.6	19 30	2 54	49	96	20 19	3 44	266	317
Dec. 3	136 Tauri	4.6	3 30	10 42	102	162	4 55	12 6	250	293
3	415 B. Tauri	6.1	8 33	15 44	88	26	9 46	16 57	297	235
4	39 Geminorum	6.2	9 58	17 4	107	46	11 8	18 14	293	233
4	40 Geminorum	6.3	10 28	17 34	130	70	11 32	18 38	269	210
5	176 B. Geminorum	6.3	1 0	8 4	90	142	1 59	9 3	279	335
5	181 B. Geminorum	6.0	1 28	8 32	118	172	2 25	9 29	252	309
5	κ Geminorum	3.7	4 18	11 22	37	96	4 54	11 57	344	42
6	39 Cancri	6.5	6 28	13 28	176	225	7 5	14 4	229	271
6	40 Cancri	6.5	6 48	13 47	197	242	6 57	13 56	209	253
7	11 Leonis	6.5	11 10	18 5	125	88	12 25	19 19	307	257
8	44 Leonis	5.9	10 10	17 1	180	184	11 1	17 52	258	242
9	75 Leonis	5.4	12 17	19 4	147	127	13 30	20 16	293	256
12	85 Virginis †	6.1	7 57	14 32	97	149	8 48	15 23	324	12
23	21 Piscium	5.6	23 46	5 40	40	40	1 10	7 3	236	211
28	18 Tauri	5.6	3 44	9 18	80	76	5 17	10 50	245	195
30	107 B. Aurigæ	6.5	5 16	10 41	112	126	6 42	12 7	249	190

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.

† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN.

FOR WASHINGTON MEAN NOON.

Date.	P	B_0	L_0	Date.	P	B_0	L_0
	°	°	°		°	°	°
Jan. 1	+ 2.02	−3.16	225.82	July 5	− 0.90	+3.42	304.01
6	− 0.42	3.73	159.97	10	+ 1.37	3.94	237.84
11	2.84	4.27	94.12	15	3.62	4.43	171.67
16	5.21	4.77	28.28	20	5.83	4.89	105.51
21	7.51	5.23	322.45	25	7.98	5.32	39.37
26	− 9.74	−5.66	256.62	30	+10.06	+5.72	333.23
31	11.87	6.04	190.79	Aug. 4	12.05	6.07	267.10
Feb. 5	13.88	6.37	124.96	9	13.94	6.38	200.99
10	15.77	6.65	59.12	14	15.73	6.64	134.89
15	17.53	6.88	353.28	19	17.41	6.86	68.81
20	−19.15	−7.05	287.43	24	+18.97	+7.04	2.74
25	20.61	7.17	221.58	29	20.39	7.16	296.68
Mar. 2	21.92	7.24	155.72	Sept. 3	21.68	7.23	230.63
7	23.08	7.25	89.85	8	22.83	7.25	164.60
12	24.07	7.20	23.96	13	23.83	7.22	98.58
17	−24.89	−7.10	318.05	18	+24.68	+7.13	32.58
22	25.54	6.95	252.13	23	25.37	6.99	326.58
27	26.01	6.74	186.20	28	25.89	6.80	260.59
Apr. 1	26.31	6.48	120.24	Oct. 3	26.24	6.56	194.62
6	26.43	6.18	54.26	8	26.42	6.27	128.65
11	−26.37	−5.83	348.26	13	+26.41	+5.94	62.69
16	26.12	5.44	282.24	18	26.21	5.56	356.74
21	25.69	5.01	216.20	23	25.82	5.13	290.80
26	25.08	4.55	150.15	28	25.24	4.67	224.86
May 1	24.28	4.06	84.07	Nov. 2	24.46	4.17	158.93
6	−23.30	−3.54	17.97	7	+23.48	+3.63	93.00
11	22.15	2.99	311.86	12	22.31	3.07	27.08
16	20.82	2.42	245.73	17	20.95	2.48	321.17
21	19.33	1.84	179.59	22	19.40	1.87	255.26
26	17.69	1.25	113.44	27	17.67	1.25	189.36
31	−15.91	−0.65	47.28	Dec. 2	+15.78	+0.61	123.47
June 5	14.00	−0.05	341.10	7	13.75	−0.03	57.58
10	11.98	+0.55	274.92	12	11.59	0.67	351.70
15	9.87	1.15	208.74	17	9.32	1.30	285.83
20	7.69	1.74	142.56	22	6.97	1.93	219.96
25	− 5.45	+2.32	76.37	27	+ 4.57	−2.54	154.10
30	− 3.18	+2.88	10.19	32	+ 2.14	−3.13	88.24

In the above table, P is the position-angle of the axis of rotation measured eastward from the north point of the disk, while L_0 and B_0 are the heliographic longitudes and latitudes, respectively, of the center of the disk. The longitudes are reckoned from the Solar Meridian which passed through the ascending node of the Sun's equator on the ecliptic, on Jan. 1, 1854, Greenwich Mean Noon.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Jan.	1	+1.83	+0.18	0.00	−0.01	333.10	−1.43	338.7
	2	+0.47	−1.19	0.00	0.01	345.27	1.42	338.1
	3	−0.94	2.50	0.00	0.01	357.43	1.42	338.2
	4	2.31	3.71	−0.01	0.01	9.59	1.41	339.1
	5	3.53	4.77	0.01	0.01	21.74	1.40	340.8
	6	−4.52	−5.64	−0.01	−0.01	33.88	−1.39	343.4
	7	5.22	6.26	0.01	0.01	46.02	1.38	347.1
	8	5.57	6.59	0.01	0.01	58.16	1.36	351.7
	9	5.55	6.58	0.01	0.01	70.29	1.35	357.0
	10	5.17	6.21	0.01	0.01	82.42	1.33	2.8
	11	−4.49	−5.48	−0.01	−0.01	94.54	−1.31	8.3
	12	3.57	4.40	0.01	0.01	106.67	1.28	13.2
	13	2.49	3.03	0.01	0.01	118.79	1.26	17.1
	14	1.34	−1.46	0.01	0.01	130.92	1.23	19.4
	15	−0.20	+0.20	0.01	0.01	143.06	1.20	21.4
	16	+0.89	+1.85	−0.01	−0.01	155.20	−1.18	21.9
	17	1.89	3.37	−0.01	0.01	167.35	1.15	21.3
	18	2.78	4.67	0.00	0.01	179.50	1.13	19.6
	19	3.56	5.68	0.00	0.01	191.66	1.11	16.7
	20	4.21	6.35	0.00	0.01	203.83	1.09	12.7
	21	+4.70	+6.65	0.00	−0.01	216.01	−1.07	7.7
	22	5.01	6.57	0.00	0.01	228.19	1.05	2.2
	23	5.12	6.14	0.00	0.01	240.38	1.03	356.5
	24	4.99	5.40	0.00	0.01	252.57	1.01	351.4
	25	4.61	4.39	−0.01	0.01	264.76	1.00	346.9
	26	+3.98	+3.18	−0.01	−0.01	276.95	−0.98	343.4
	27	3.10	1.85	0.01	0.01	289.14	0.97	340.4
	28	2.01	+0.45	0.01	0.01	301.33	0.95	339.1
	29	+0.75	−0.96	0.01	0.01	313.51	0.94	338.2
	30	−0.62	2.32	0.01	0.02	325.69	0.92	338.0
	31	−2.03	−3.57	−0.01	−0.02	337.87	−0.91	338.6
Feb.	1	3.39	4.67	0.01	0.02	350.04	0.89	340.8
	2	4.62	5.59	0.02	0.02	2.21	0.87	342.3
	3	5.64	6.27	0.02	0.02	14.37	0.85	345.5
	4	6.36	6.68	0.02	0.02	26.52	0.83	349.7
	5	−6.72	−6.77	−0.02	−0.02	38.67	−0.81	354.7
	6	6.68	6.51	0.02	0.02	50.81	0.78	0.3
	7	6.22	5.89	0.02	0.02	62.95	0.75	6.0
	8	5.37	4.90	0.02	0.02	75.09	0.72	11.2
	9	4.18	3.58	0.02	0.02	87.22	0.69	15.6
	10	−2.74	−2.00	−0.02	−0.02	99.35	−0.66	18.9
	11	−1.16	−0.27	0.02	0.02	111.48	0.62	21.0
	12	+0.45	+1.47	0.01	0.02	123.62	0.58	21.9
	13	1.97	3.11	0.01	0.02	135.76	0.55	21.7
	14	3.32	4.53	0.01	0.02	147.91	0.51	20.3
	15	+4.45	+5.64	−0.01	−0.02	160.06	−0.48	17.5
	16	+5.31	+6.39	−0.01	−0.02	172.22	−0.45	13.7

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Feb.	16	+5.31	+6.39	−0.01	−0.02	172.22	−0.45	13.78
	17	5.88	6.75	0.01	0.02	184.39	0.42	8.98
	18	6.16	6.73	0.01	0.02	196.56	0.39	3.55
	19	6.17	6.36	0.01	0.02	208.74	0.36	357.96
	20	5.91	5.67	0.01	0.02	220.93	0.33	352.69
	21	+5.40	+4.70	−0.01	−0.02	233.13	−0.31	348.10
	22	4.67	3.53	0.01	0.02	245.32	0.28	344.37
	23	3.74	2.21	0.01	0.02	257.52	0.26	341.54
	24	2.64	+0.80	0.02	0.02	269.73	0.24	339.57
	25	1.41	−0.63	0.02	0.02	281.93	0.22	338.42
	26	+0.08	−2.01	−0.02	−0.02	294.13	−0.20	338.03
	27	−1.31	3.31	0.02	0.02	306.32	0.18	338.40
	28	2.71	4.47	0.02	0.02	318.52	0.16	339.56
Mar.	1	4.05	5.44	0.02	0.02	330.71	0.14	341.55
	2	5.27	6.18	0.02	0.02	342.90	0.12	344.43
	3	−6.30	−6.66	−0.02	−0.02	355.08	−0.09	348.22
	4	7.07	6.85	0.02	0.02	7.26	0.07	352.86
	5	7.52	6.71	0.02	0.02	19.43	0.05	358.14
	6	7.59	6.23	0.02	0.02	31.59	−0.02	3.69
	7	7.24	5.39	0.02	0.02	43.75	+0.01	9.04
	8	−6.45	−4.21	−0.02	−0.02	55.91	+0.04	13.77
	9	5.25	2.73	0.02	0.02	68.06	0.07	17.55
	10	3.69	−1.04	0.02	0.02	80.20	0.11	20.21
	11	−1.88	+0.75	0.02	0.02	92.35	0.15	21.69
	12	+0.06	2.50	0.02	0.02	104.50	0.18	21.96
	13	+1.98	+4.07	−0.02	−0.02	116.65	+0.22	20.97
	14	3.74	5.34	0.02	0.02	128.80	0.26	18.68
	15	5.22	6.23	0.02	0.02	140.96	0.29	15.12
	16	6.33	6.71	0.02	0.02	153.12	0.33	10.44
	17	7.02	6.78	0.02	0.02	165.29	0.36	5.00
	18	+7.30	+6.48	−0.02	−0.02	177.47	+0.39	359.31
	19	7.19	5.84	0.02	0.02	189.66	0.42	353.89
	20	6.73	4.92	0.02	0.02	201.85	0.45	349.12
	21	5.98	3.79	0.02	0.02	214.05	0.47	345.19
	22	4.99	2.51	0.02	0.02	226.25	0.50	342.16
	23	+3.83	+1.13	−0.02	−0.02	238.46	+0.52	340.00
	24	2.55	−0.29	0.02	0.02	250.68	0.54	338.64
	25	+1.19	1.68	0.02	0.02	262.89	0.56	338.04
	26	−0.20	3.00	0.02	0.02	275.11	0.58	338.21
	27	1.59	4.18	0.02	0.02	287.33	0.60	339.15
	28	−2.94	−5.19	−0.02	−0.02	299.54	+0.62	340.91
	29	4.20	5.98	0.02	0.02	311.76	0.64	343.55
	30	5.34	6.52	0.02	0.02	323.97	0.66	347.09
	31	6.32	6.77	0.03	0.02	336.17	0.67	351.46
Apr.	1	7.09	6.72	0.03	0.02	348.37	0.69	356.49
	2	−7.59	−6.34	−0.03	−0.02	0.57	+0.71	1.87
	3	−7.77	−5.63	−0.03	−0.02	12.76	+0.73	7.19

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Apr.	1	−7.09	−6.72	−0.03	−0.02	348.37	+0.69	356.49
	2	7.59	6.34	0.03	0.02	0.57	0.71	1.87
	3	7.77	5.63	0.03	0.02	12.76	0.73	7.19
	4	7.58	4.60	0.02	0.02	24.94	0.76	12.03
	5	6.99	3.28	0.02	0.02	37.12	0.78	16.09
	6	−5.98	−1.72	−0.02	−0.02	49.29	+0.81	19.17
	7	4.56	−0.01	0.02	0.02	61.46	0.84	21.16
	8	2.79	+1.73	0.02	0.02	73.62	0.87	22.00
	9	−0.79	3.38	0.02	0.02	85.79	0.89	21.61
	10	+1.29	4.79	0.02	0.02	97.95	0.92	19.90
	11	+3.29	+5.85	−0.02	−0.02	110.11	+0.95	16.81
	12	5.03	6.49	0.02	0.02	122.28	0.98	12.41
	13	6.39	6.69	0.02	0.02	134.45	1.01	7.02
	14	7.28	6.48	0.02	0.02	146.63	1.04	1.17
	15	7.67	5.91	0.02	0.02	158.81	1.06	355.45
	16	+7.59	+5.04	−0.02	−0.02	171.00	+1.08	350.35
	17	7.09	3.94	0.02	0.02	183.20	1.10	346.13
	18	6.25	2.69	0.02	0.02	195.41	1.12	342.85
	19	5.15	+1.34	0.02	0.02	207.62	1.14	340.46
	20	3.87	−0.05	0.02	0.02	219.84	1.16	338.90
	21	+2.49	−1.43	−0.02	−0.02	232.06	+1.18	338.11
	22	+1.07	2.74	0.02	0.02	244.29	1.19	338.08
	23	−0.33	3.93	0.02	0.02	256.52	1.21	338.82
	24	1.66	4.95	0.02	0.02	268.75	1.22	340.37
	25	2.90	5.76	0.02	0.02	280.99	1.23	342.79
	26	−4.02	−6.33	−0.02	−0.02	293.22	+1.24	346.12
	27	5.01	6.62	0.02	0.02	305.45	1.25	350.32
	28	5.84	6.60	0.02	0.02	317.68	1.26	355.21
	29	6.49	6.28	0.02	0.02	329.90	1.27	0.50
	30	6.93	5.64	0.02	0.02	342.12	1.28	5.80
May	1	−7.12	−4.70	−0.02	−0.02	354.33	+1.29	10.71
	2	7.02	3.49	0.02	0.02	6.54	1.30	14.91
	3	6.59	2.06	0.02	0.02	18.74	1.31	18.22
	4	5.80	−0.47	0.02	0.02	30.94	1.32	20.54
	5	4.64	+1.19	0.02	0.02	43.13	1.34	21.81
	6	−3.12	+2.81	−0.02	−0.02	55.31	+1.36	21.95
	7	−1.32	4.26	0.02	0.02	67.49	1.37	20.86
	8	+0.63	5.42	0.02	0.02	79.67	1.39	18.41
	9	2.58	6.20	0.02	0.02	91.85	1.40	14.57
	10	4.35	6.54	0.01	0.02	104.02	1.42	9.49
	11	+5.79	+6.45	−0.01	−0.02	116.20	+1.43	3.62
	12	6.78	5.96	0.01	0.02	128.39	1.45	357.62
	13	7.27	5.14	0.01	0.02	140.58	1.46	352.10
	14	7.26	4.07	0.01	0.02	152.77	1.47	347.44
	15	6.80	2.82	0.01	0.02	164.97	1.48	343.77
	16	+5.97	+1.47	−0.01	−0.02	177.18	+1.49	341.07
	17	+4.86	+0.08	−0.01	−0.03	189.40	+1.50	339.26

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
May	17	+4.86	+0.08	−0.01	−0.03	189.40	+1.50	339.26
	18	3.56	−1.28	0.02	0.03	201.62	1.51	338.25
	19	2.17	2.58	0.02	0.03	213.85	1.52	338.00
	20	+0.77	3.77	0.02	0.03	226.09	1.52	338.52
	21	−0.58	4.80	0.02	0.03	238.33	1.53	339.84
	22	−1.83	−5.63	−0.02	−0.03	250.57	+1.53	342.03
	23	2.93	6.21	0.02	0.03	262.81	1.54	345.14
	24	3.86	6.52	0.02	0.03	275.05	1.54	349.15
	25	4.62	6.53	0.02	0.03	287.30	1.53	353.94
	26	5.21	6.22	0.02	0.03	299.54	1.53	359.21
	27	−5.62	−5.61	−0.02	−0.03	311.78	+1.53	4.57
	28	5.85	4.70	0.02	0.03	324.02	1.52	9.60
	29	5.89	3.53	0.02	0.03	336.26	1.52	13.96
	30	5.72	2.15	0.02	0.02	348.49	1.52	17.46
	31	5.32	−0.62	0.02	0.02	0.71	1.52	20.00
June	1	−4.65	+0.97	−0.02	−0.02	12.92	+1.51	21.55
	2	3.69	2.53	0.01	0.02	25.13	1.51	22.06
	3	2.45	3.96	0.01	0.02	37.33	1.51	21.44
	4	−0.97	5.15	0.01	0.02	49.53	1.51	19.57
	5	+0.65	6.00	0.01	0.02	61.72	1.51	16.35
	6	+2.30	+6.45	−0.01	−0.02	73.91	+1.51	11.81
	7	3.83	6.47	0.01	0.02	86.09	1.51	6.23
	8	5.09	6.08	0.01	0.02	98.28	1.51	0.17
	9	5.98	5.32	0.01	0.03	110.47	1.51	354.32
	10	6.42	4.27	0.01	0.03	122.66	1.51	349.19
	11	+6.41	+3.02	−0.01	−0.03	134.86	+1.51	345.05
	12	5.98	1.65	0.01	0.03	147.06	1.50	341.94
	13	5.18	+0.24	0.01	0.03	159.27	1.50	339.78
	14	4.10	−1.16	0.01	0.03	171.49	1.50	338.48
	15	2.83	2.48	0.01	0.03	183.71	1.49	337.98
	16	+1.48	−3.69	−0.01	−0.03	195.94	+1.49	338.25
	17	+0.13	4.73	0.01	0.03	208.17	1.49	339.31
	18	−1.15	5.58	0.01	0.03	220.41	1.48	341.23
	19	2.30	6.19	0.01	0.03	232.65	1.47	344.06
	20	3.26	6.53	0.01	0.03	244.90	1.47	347.82
	21	−4.00	−6.57	−0.01	−0.03	257.15	+1.46	352.43
	22	4.51	6.30	0.01	0.03	269.40	1.44	357.66
	23	4.81	5.71	0.01	0.03	281.65	1.43	3.11
	24	4.91	4.81	0.01	0.03	293.90	1.42	8.33
	25	4.82	3.64	0.01	0.03	306.15	1.40	12.95
	26	−4.56	−2.25	−0.01	−0.03	318.40	+1.39	16.71
	27	4.14	−0.71	0.01	0.03	330.64	1.37	19.49
	28	3.56	+0.88	0.01	0.03	342.87	1.36	21.28
	29	2.82	2.44	0.01	0.03	355.10	1.34	22.05
	30	1.92	3.87	−0.01	0.03	7.32	1.32	21.74
July	1	−0.86	+5.07	0.00	−0.03	19.54	+1.31	20.27
	2	+0.32	+5.96	0.00	−0.03	31.75	+1.29	17.54

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
July 1	−0.86	+5.07	0.00	−0.03	19.54	+1.31	20.27
2	+0.32	5.96	0.00	0.03	31.75	1.29	17.54
3	1.56	6.48	0.00	0.03	43.95	1.28	13.52
4	2.78	6.58	0.00	0.03	56.15	1.26	8.37
5	3.89	6.28	0.00	0.03	68.34	1.24	2.52
6	+4.78	+5.60	0.00	−0.03	80.53	+1.23	356.58
7	5.36	4.60	0.00	0.03	92.72	1.21	351.13
8	5.59	3.36	0.00	0.03	104.92	1.20	346.56
9	5.45	1.97	0.00	0.03	117.11	1.18	343.02
10	4.95	+0.52	0.00	0.03	129.31	1.16	340.48
11	+4.13	−0.93	0.00	−0.03	141.51	+1.15	338.84
12	3.07	2.31	0.00	0.03	153.72	1.13	338.04
13	1.84	3.56	0.00	0.03	165.93	1.12	338.04
14	+0.52	4.66	0.00	0.03	178.15	1.11	338.83
15	−0.80	5.56	0.00	0.03	190.38	1.09	340.45
16	−2.03	−6.22	0.00	−0.03	202.61	+1.08	342.97
17	3.11	6.62	0.00	0.03	214.84	1.06	346.41
18	3.98	6.72	0.00	0.03	227.09	1.05	350.74
19	4.58	6.51	0.00	0.03	239.33	1.03	355.80
20	4.90	5.97	0.00	0.03	251.58	1.01	1.25
21	−4.94	−5.11	0.00	−0.03	263.83	+0.99	6.65
22	4.71	3.96	0.00	0.03	276.08	0.97	11.57
23	4.25	2.56	0.00	0.03	288.33	0.95	15.68
24	3.59	−0.98	0.00	0.03	300.58	0.92	18.82
25	2.78	+0.67	0.00	0.03	312.83	0.90	20.92
26	−1.86	+2.29	0.00	−0.03	325.07	+0.87	21.97
27	−0.87	3.77	0.00	0.03	337.31	0.84	21.94
28	+0.17	5.02	0.00	0.03	349.54	0.82	20.75
29	1.22	5.97	0.00	0.03	1.76	0.79	18.34
30	2.24	6.55	0.00	0.03	13.97	0.76	14.69
31	+3.18	+6.72	+0.01	−0.03	26.18	+0.74	9.89
Aug. 1	4.00	6.49	0.01	0.03	38.38	0.71	4.30
2	4.64	5.89	0.01	0.03	50.58	0.68	358.44
3	5.07	4.96	0.01	0.03	62.77	0.65	352.88
4	5.24	3.77	0.01	0.03	74.96	0.63	348.05
5	+5.13	+2.40	+0.01	−0.03	87.15	+0.60	344.17
6	4.73	+0.93	0.01	0.03	99.34	0.57	341.28
7	4.06	−0.56	0.01	0.03	111.53	0.55	339.32
8	3.16	1.99	0.01	0.03	123.72	0.52	338.22
9	2.06	3.31	+0.01	0.03	135.91	0.50	337.93
10	+0.82	−4.48	0.00	−0.03	148.11	+0.48	338.44
11	−0.49	5.45	0.00	0.03	160.32	0.46	339.78
12	1.79	6.18	0.00	0.03	172.53	0.44	341.98
13	3.01	6.65	0.00	0.03	184.74	0.42	345.08
14	4.08	6.83	0.00	0.03	196.96	0.40	349.08
15	−4.93	−6.71	0.00	−0.03	209.19	+0.38	353.86
16	−5.49	−6.28	0.00	−0.03	221.42	+0.36	359.16

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

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		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Aug.	16	−5.49	−6.28	0.00	−0.03	221.42	+0.36	359.16
	17	5.73	5.52	0.00	0.03	233.66	0.34	4.60
	18	5.62	4.44	0.00	0.03	245.90	0.32	9.75
	19	5.17	3.09	0.00	0.03	258.14	0.29	14.23
	20	4.39	−1.52	0.00	0.03	270.39	0.26	17.79
	21	−3.34	+0.17	0.00	−0.03	282.63	+0.24	20.32
	22	2.08	1.87	+0.01	0.03	294.87	0.21	21.76
	23	−0.71	3.46	0.01	0.03	307.11	0.18	22.08
	24	+0.69	4.82	0.01	0.03	319.35	0.15	21.21
	25	2.03	5.87	0.01	0.03	331.58	0.12	19.08
	26	+3.24	+6.53	+0.01	−0.03	343.80	+0.09	15.68
	27	4.26	6.78	0.01	0.03	356.01	0.05	11.10
	28	5.05	6.63	0.01	0.03	8.22	+0.02	5.67
	29	5.58	6.10	0.01	0.03	20.42	−0.01	359.88
	30	5.85	5.24	0.01	0.03	32.62	0.05	354.27
	31	+5.86	+4.11	+0.01	−0.03	44.81	−0.08	349.30
Sept.	1	5.62	2.79	0.01	0.03	56.99	0.11	345.21
	2	5.14	+1.35	0.01	0.03	69.17	0.15	342.06
	3	4.44	−0.13	0.01	0.03	81.35	0.18	339.83
	4	3.55	1.59	0.01	0.03	93.53	0.21	338.47
	5	+2.50	−2.96	+0.01	−0.04	105.71	−0.24	337.92
	6	1.32	4.18	0.01	0.04	117.89	0.26	338.17
	7	+0.06	5.20	0.01	0.04	130.07	0.29	339.24
	8	−1.25	6.00	0.01	0.04	142.25	0.31	341.16
	9	2.56	6.55	0.01	0.04	154.44	0.33	343.96
	10	−3.79	−6.82	+0.01	−0.04	166.64	−0.35	347.64
	11	4.89	6.79	0.01	0.04	178.84	0.37	352.12
	12	5.78	6.46	0.01	0.04	191.04	0.39	357.19
	13	6.40	5.82	0.01	0.04	203.25	0.41	2.53
	14	6.69	4.87	0.01	0.03	215.47	0.42	7.74
	15	−6.59	−3.64	+0.01	−0.03	227.69	−0.44	12.45
	16	6.08	2.17	0.01	0.03	239.92	0.46	16.39
	17	5.16	−0.52	0.01	0.03	252.14	0.48	19.37
	18	3.86	+1.20	0.01	0.03	264.37	0.51	21.30
	19	2.25	2.87	0.01	0.03	276.60	0.54	22.11
	20	−0.46	+4.36	+0.01	−0.03	288.83	−0.56	21.70
	21	+1.38	5.54	0.01	0.03	301.06	0.59	19.97
	22	3.12	6.34	0.01	0.03	313.28	0.62	16.87
	23	4.63	6.71	0.01	0.03	325.50	0.65	12.49
	24	5.82	6.64	0.01	0.03	337.71	0.68	7.12
	25	+6.63	+6.18	+0.02	−0.03	349.91	−0.71	1.27
	26	7.05	5.38	0.02	0.03	2.11	0.74	355.54
	27	7.10	4.31	0.02	0.03	14.30	0.77	350.40
	28	6.82	3.04	0.02	0.03	26.48	0.81	346.11
	29	6.26	1.64	0.02	0.03	38.66	0.84	342.76
	30	+5.48	+0.19	+0.02	−0.04	50.83	−0.87	340.32
Oct.	1	+4.52	−1.25	+0.02	−0.04	63.00	−0.90	338.74

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Oct.	1	+4.52	−1.25	+0.02	−0.04	63.00	−0.90	338.74
	2	3.42	2.62	0.01	0.04	75.16	0.93	337.97
	3	2.23	3.86	0.01	0.04	87.33	0.96	338.00
	4	+0.97	4.92	0.01	0.04	99.49	0.98	338.83
	5	−0.33	5.76	0.01	0.04	111.65	1.00	340.51
	6	−1.64	−6.35	+0.01	−0.04	123.82	−1.02	343.06
	7	2.92	6.67	0.01	0.04	135.98	1.03	346.49
	8	4.14	6.71	0.01	0.04	148.15	1.05	350.73
	9	5.25	6.45	0.01	0.04	160.33	1.06	355.60
	10	6.19	5.90	0.01	0.04	172.51	1.07	0.79
	11	−6.89	−5.06	+0.01	−0.04	184.69	−1.08	5.06
	12	7.30	3.96	0.01	0.04	196.88	1.09	10.76
	13	7.34	2.62	0.01	0.04	209.08	1.10	14.91
	14	6.95	−1.09	0.01	0.03	221.28	1.11	18.22
	15	6.09	+0.55	0.01	0.03	233.49	1.12	20.58
	16	−4.77	+2.20	+0.01	−0.03	245.70	−1.14	21.90
	17	3.05	3.74	0.01	0.03	257.91	1.15	22.06
	18	−1.04	5.05	0.01	0.03	270.13	1.17	20.93
	19	+1.10	6.00	0.01	0.03	282.34	1.18	18.37
	20	3.17	6.51	0.01	0.03	294.55	1.20	14.37
	21	+5.00	+6.57	+0.01	−0.03	306.76	−1.22	9.14
	22	6.44	6.19	0.01	0.03	318.96	1.25	3.19
	23	7.41	5.44	0.01	0.03	331.16	1.27	357.19
	24	7.89	4.40	0.01	0.04	343.35	1.29	351.71
	25	7.90	3.15	0.01	0.04	355.53	1.32	347.11
	26	+7.51	+1.78	+0.01	−0.04	7.71	−1.34	343.50
	27	6.80	+0.35	0.01	0.04	19.88	1.36	340.83
	28	5.84	−1.07	0.01	0.04	32.04	1.39	339.04
	29	4.70	2.42	0.01	0.04	44.20	1.41	338.07
	30	3.46	3.65	0.01	0.04	56.36	1.43	337.89
	31	+2.17	−4.71	+0.01	−0.04	68.51	−1.45	338.51
Nov.	1	+0.86	5.56	0.01	0.04	80.65	1.46	339.96
	2	−0.44	6.17	0.01	0.04	92.80	1.47	342.29
	3	1.70	6.51	0.01	0.04	104.95	1.48	345.51
	4	2.91	6.58	0.01	0.04	117.10	1.49	349.57
	5	−4.05	−6.36	+0.01	−0.04	129.24	−1.49	354.30
	6	5.09	5.85	0.01	0.04	141.39	1.49	359.42
	7	6.00	5.07	0.01	0.04	153.55	1.49	4.57
	8	6.72	4.03	0.01	0.04	165.71	1.49	9.41
	9	7.19	2.78	0.01	0.04	177.88	1.48	13.67
	10	−7.35	−1.36	+0.01	−0.04	190.05	−1.48	17.17
	11	7.13	+0.18	0.01	0.04	202.22	1.47	19.81
	12	6.47	1.76	0.01	0.04	214.40	1.47	21.50
	13	5.35	3.27	0.01	0.03	226.59	1.47	22.16
	14	3.79	4.60	0.01	0.03	238.79	1.47	21.65
	15	−1.87	+5.65	+0.01	−0.03	250.99	−1.47	19.79
	16	+0.27	+6.30	+0.01	−0.03	263.18	−1.48	16.45

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
ov.	16	+0.27	+6.30	+0.01	−0.03	263.18	−1.48	16.45
	17	2.43	6.50	0.01	0.04	275.38	1.48	11.68
	18	4.40	6.24	0.01	0.04	287.58	1.49	5.84
	19	6.02	5.56	0.01	0.04	299.78	1.49	359.59
	20	7.16	4.55	0.01	0.04	311.97	1.50	353.67
	21	+7.78	+3.30	+0.01	−0.04	324.16	−1.51	348.58
	22	7.89	1.90	0.01	0.04	336.34	1.52	344.53
	23	7.54	+0.45	0.01	0.04	348.51	1.53	341.51
	24	6.83	−0.98	0.01	0.04	0.68	1.54	339.44
	25	5.83	2.34	0.01	0.04	12.84	1.55	338.23
	26	+4.64	−3.57	+0.01	−0.04	24.99	−1.56	337.83
	27	3.35	4.64	0.01	0.04	37.14	1.57	338.23
	28	2.02	5.50	0.01	0.04	49.28	1.58	339.45
	29	+0.70	6.12	+0.01	0.04	61.42	1.59	341.55
	30	−0.56	6.48	0.00	0.04	73.56	1.58	344.55
ec.	1	−1.74	−6.56	0.00	−0.04	85.69	−1.57	348.42
	2	2.82	6.35	0.00	0.04	97.82	1.57	353.04
	3	3.80	5.85	0.00	0.04	109.95	1.56	358.12
	4	4.67	5.07	0.00	0.04	122.09	1.54	3.33
	5	5.40	4.05	0.00	0.04	134.23	1.53	8.29
	6	−5.98	−2.82	0.00	−0.04	146.37	−1.51	12.69
	7	6.37	−1.42	0.00	0.04	158.51	1.49	16.35
	8	6.51	+0.08	0.00	0.04	170.66	1.47	19.17
	9	6.35	1.61	0.00	0.04	182.82	1.45	21.10
	10	5.85	3.08	0.00	0.04	194.98	1.43	22.09
	11	−4.96	+4.40	0.00	−0.04	207.15	−1.42	22.02
	12	3.69	5.47	0.00	0.04	219.33	1.40	20.75
	13	2.09	6.20	0.00	0.04	231.51	1.38	18.12
	14	−0.26	6.52	0.00	0.04	243.69	1.37	14.04
	15	+1.64	6.40	0.00	0.04	255.88	1.36	8.68
	16	+3.45	+5.83	0.00	−0.04	268.07	−1.35	2.53
	17	4.99	4.88	0.00	0.04	280.26	1.34	356.30
	18	6.14	3.64	0.00	0.04	292.45	1.33	350.68
	19	6.83	2.21	0.00	0.04	304.64	1.32	346.07
	20	7.04	+0.70	0.00	0.04	316.82	1.32	342.55
	21	+6.79	−0.80	0.00	−0.04	329.00	−1.32	340.07
	22	6.16	2.22	0.00	0.04	341.17	1.31	338.53
	23	5.23	3.51	0.00	0.04	353.33	1.31	337.85
	24	4.08	4.62	0.00	0.04	5.49	1.30	337.99
	25	2.81	5.51	0.00	0.04	17.64	1.30	338.96
	26	+1.50	−6.17	0.00	−0.04	29.78	−1.29	340.79
	27	+0.21	6.56	0.00	0.04	41.92	1.28	343.53
	28	−1.01	6.67	0.00	0.04	54.06	1.27	347.16
	29	2.10	6.49	0.00	0.04	66.19	1.26	351.59
	30	3.04	6.01	0.00	0.04	78.32	1.24	356.61
	31	−3.82	−5.25	−0.01	−0.04	90.45	−1.22	1.88
	32	−4.44	−4.22	−0.01	−0.04	102.58	−1.19	7.00

FOR WASHINGTON MEAN NOON.

Date.		k	i	θ	L	Stellar Mag.	Date.		k	i	θ	L	Stellar Mag.
			°	°						°	°		
Jan.	1	0.932	30	180	26.9	−0.4	July	5	0.106	142	22	14.7	+1.9
	6	0.956	24	173	25.4	0.5		10	0.041	157	34	6.5	2.5
	11	0.975	18	165	25.1	0.6		15	0.010	168	81	1.8	3.0
	16	0.988	13	154	25.9	0.7		20	0.027	161	151	4.6	2.6
	21	0.996	7	129	27.9	0.9		25	0.096	144	170	15.1	1.9
	26	0.998	5	51	31.5	−1.0		30	0.212	125	178	29.8	+1.1
	31	0.989	12	6	37.2	1.1	Aug.	4	0.367	105	184	45.6	+0.4
Feb.	5	0.959	23	352	45.5	1.1		9	0.551	84	190	59.9	−0.2
	10	0.893	38	344	56.4	1.0		14	0.737	62	196	68.5	0.8
	15	0.771	57	339	67.2	0.9		19	0.886	40	204	67.5	1.2
	20	0.582	81	334	69.6	−0.4		24	0.970	20	215	58.9	−1.4
	25	0.354	107	330	55.6	+0.2		29	0.997	6	261	48.5	1.5
Mar.	2	0.148	135	324	28.3	1.2	Sept.	3	0.991	11	0	39.9	1.2
	7	0.024	162	298	5.0	2.4		8	0.969	20	15	33.9	0.8
	12	0.014	166	197	2.9	2.7		13	0.940	28	20	30.1	0.6
	17	0.085	146	168	14.2	+1.9		18	0.908	35	23	27.9	−0.3
	22	0.192	128	161	25.3	1.3		23	0.872	42	24	27.1	0.2
	27	0.300	114	157	30.9	1.0		28	0.832	48	25	27.3	−0.1
Apr.	1	0.397	102	155	32.6	0.7	Oct.	3	0.785	55	25	28.7	+0.0
	6	0.481	92	153	32.7	0.6		8	0.728	63	24	31.2	0.1
	11	0.555	84	152	32.6	+0.4		13	0.654	72	24	34.9	+0.1
	16	0.623	76	151	33.0	0.3		18	0.555	84	23	39.1	0.3
	21	0.690	68	151	34.3	+0.1		23	0.425	99	23	42.1	0.4
	26	0.758	59	151	37.1	−0.2		28	0.257	119	23	37.3	0.8
May	1	0.829	49	151	41.7	0.5	Nov.	2	0.082	147	25	16.8	1.7
	6	0.902	37	153	48.6	−0.9		7	0.000	178	186	0.1	+3.1
	11	0.966	21	156	57.3	1.4		12	0.108	142	206	24.0	1.4
	16	1.000	3	173	65.2	1.9		17	0.338	109	206	53.6	+0.3
	21	0.968	21	339	67.3	1.6		22	0.558	83	205	58.7	−0.2
	26	0.894	38	345	63.3	1.2		27	0.718	64	203	51.0	0.4
	31	0.794	54	351	56.0	−0.7	Dec.	2	0.822	50	200	41.9	−0.5
June	5	0.675	70	356	47.9	−0.2		7	0.888	39	196	34.8	0.5
	10	0.558	83	1	40.8	+0.2		12	0.932	30	192	29.9	0.5
	15	0.455	95	5	36.1	0.5		17	0.959	23	186	26.8	0.5
	20	0.363	106	9	32.1	0.8		22	0.978	17	178	25.1	0.6
	25	0.274	117	12	27.8	+1.1		27	0.990	11	167	24.6	−0.7
	30	0.187	129	16	22.2	+1.5		32	0.997	6	142	25.1	−0.8

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

The magnitudes of the planet have been computed from formulæ given in the Potsdam Observations, vol. 8, page 366.

FOR WASHINGTON MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
Jan. 1	0.986	13.4	179.6	48.7	−3.4	July 5	0.785	55.3	15.7	72.1	−3.5
6	0.989	11.8	175.5	48.3	3.4	10	0.769	57.5	17.3	74.5	3.5
11	0.992	10.2	171.0	47.9	3.4	15	0.752	59.7	18.7	77.2	3.5
16	0.995	8.6	166.1	47.6	3.4	20	0.735	61.9	20.0	80.2	3.5
21	0.997	7.0	160.5	47.4	3.4	25	0.718	64.1	21.1	83.4	3.6
26	0.998	5.4	153.3	47.2	−3.5	30	0.700	66.3	22.0	86.9	−3.6
31	0.999	3.9	142.7	47.0	3.5	Aug. 4	0.682	68.6	22.7	90.8	3.6
Feb. 5	1.000	2.6	123.9	46.9	3.5	9	0.663	70.9	23.2	95.1	3.6
10	1.000	1.8	83.3	46.8	3.5	14	0.644	73.3	23.5	99.8	3.7
15	1.000	2.3	35.6	46.8	3.5	19	0.624	75.7	23.6	105.0	3.7
20	0.999	3.5	12.0	46.9	−3.5	24	0.603	78.1	23.6	110.7	−3.8
25	0.998	5.0	0.9	47.0	3.5	29	0.581	80.6	23.4	116.9	3.8
Mar. 2	0.997	6.6	354.3	47.1	3.4	Sept. 3	0.558	83.2	23.1	123.7	3.9
7	0.995	8.2	350.2	47.3	3.4	8	0.535	85.9	22.6	131.2	3.9
12	0.993	9.9	347.2	47.5	3.4	13	0.511	88.7	22.0	139.4	4.0
17	0.990	11.6	345.1	47.8	−3.4	18	0.486	91.6	21.3	148.3	−4.0
22	0.987	13.3	343.7	48.2	3.4	23	0.459	94.7	20.5	157.9	4.1
27	0.983	15.1	342.8	48.6	3.4	28	0.430	98.0	19.6	168.1	4.1
Apr. 1	0.979	16.9	342.3	49.0	3.4	Oct. 3	0.400	101.6	18.7	178.6	4.2
6	0.974	18.7	342.2	49.5	3.4	8	0.367	105.5	17.9	188.8	4.2
11	0.968	20.5	342.5	50.1	−3.4	13	0.332	109.7	17.1	198.3	−4.3
16	0.962	22.4	343.2	50.7	3.3	18	0.294	114.3	16.5	205.7	4.3
21	0.956	24.3	344.1	51.4	3.3	23	0.254	119.5	16.2	208.7	4.3
26	0.949	26.2	345.3	52.1	3.3	28	0.211	125.3	16.2	204.8	4.3
May 1	0.941	28.1	346.8	52.9	3.3	Nov. 2	0.166	132.0	16.6	190.2	4.3
6	0.932	30.1	348.6	53.8	−3.3	7	0.119	139.6	17.7	161.2	−4.2
11	0.923	32.1	350.6	54.8	3.3	12	0.075	148.2	19.6	117.7	4.0
16	0.914	34.1	352.8	55.8	3.3	17	0.037	157.8	22.8	65.7	3.7
21	0.904	36.2	355.1	56.9	3.3	22	0.011	168.2	30.0	20.3	3.3
26	0.893	38.3	357.5	58.1	3.3	27	0.000	177.5	99.8	0.9	2.9
31	0.881	40.3	0.0	59.4	−3.4	Dec. 2	0.009	169.0	188.0	18.0	−3.3
June 5	0.869	42.4	2.5	60.8	3.4	7	0.035	158.5	195.1	63.2	3.7
10	0.856	44.5	5.0	62.3	3.4	12	0.073	148.7	197.4	117.4	4.0
15	0.843	46.6	7.4	64.0	3.4	17	0.118	139.9	198.3	164.3	4.2
20	0.829	48.7	9.7	65.8	3.4	22	0.165	132.1	198.3	196.4	4.3
25	0.815	50.9	11.9	67.7	−3.4	27	0.211	125.3	197.8	213.3	−4.4
30	0.800	53.1	13.9	69.8	−3.4	32	0.255	119.3	196.8	218.9	−4.4

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

The magnitudes of the planet have been computed from formulæ given in the Potsdam Observations, vol. 8, page 366.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

WASHINGTON MEAN TIME.

Noon.		Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180°$	$D_{\oplus}$	$A_{\odot}-A_{\oplus}$	$D_{\odot}$	$\odot$
		m		°	°	°	°	°	°
Jan.	1	5.17	−1.2	343.36	197.91	+5.31	− 4.20	+ 6.02	14.9
	3	5.18	1.3	342.91	197.20	4.94	2.62	6.39	15.8
	5	5.19	1.3	342.46	196.48	4.58	− 1.04	6.76	16.8
	7	5.21	1.2	342.01	195.77	4.23	+ 0.54	7.12	17.7
	9	5.24	1.2	341.57	195.07	3.88	2.11	7.49	18.7
	11	5.27	−1.2	341.14	194.38	+3.55	+ 3.67	+ 7.85	19.6
	13	5.31	1.1	340.73	193.71	3.24	5.21	8.21	20.5
	15	5.36	1.1	340.33	193.06	2.94	6.72	8.56	21.4
	17	5.42	1.0	339.96	192.45	2.66	8.21	8.92	22.4
	19	5.48	1.0	339.61	191.86	2.40	9.66	9.27	23.3
	21	5.55	−0.9	339.28	191.31	+2.16	+11.07	+ 9.61	24.2
	23	5.62	0.9	338.97	190.80	1.94	12.45	9.96	25.1
	25	5.71	0.8	338.70	190.33	1.75	13.78	10.30	26.1
	27	5.79	0.8	338.45	189.90	1.58	15.07	10.64	27.0
	29	5.89	0.7	338.23	189.53	1.44	16.31	10.98	27.9
	31	5.99	−0.6	338.04	189.20	+1.33	+17.51	+11.31	28.8
Feb.	2	6.09	0.6	337.89	188.91	1.24	18.66	11.64	29.7
	4	6.20	0.5	337.76	188.68	1.18	19.76	11.96	30.6
	6	6.31	0.5	337.66	188.49	1.14	20.82	12.28	31.5
	8	6.42	0.4	337.59	188.35	1.12	21.83	12.60	32.4
	10	6.55	−0.4	337.54	188.25	+1.12	+22.79	+12.92	33.3
	12	6.67	0.3	337.52	188.20	1.15	23.71	13.23	34.2
	14	6.80	0.3	337.53	188.20	1.20	24.58	13.54	35.1
	16	6.93	0.2	337.56	188.24	1.27	25.41	13.85	36.0
	18	7.06	0.1	337.62	188.32	1.36	26.20	14.15	36.9
	20	7.20	−0.1	337.70	188.44	+1.48	+26.95	+14.45	37.8
	22	7.34	0.0	337.81	188.61	1.61	27.66	14.74	38.77
	24	7.48	0.0	337.94	188.81	1.76	28.33	15.03	39.6
	26	7.63	+0.1	338.09	189.05	1.93	28.97	15.32	40.55
	28	7.78	0.1	338.26	189.32	2.11	29.57	15.60	41.44
Mar.	2	7.92	+0.2	338.45	189.63	+2.31	+30.14	+15.88	42.33
	4	8.07	0.2	338.66	189.98	2.53	30.67	16.16	43.22
	6	8.23	0.3	338.89	190.35	2.76	31.17	16.43	44.11
	8	8.38	0.3	339.14	190.76	3.00	31.65	16.70	45.00
	10	8.53	0.4	339.41	191.20	3.26	32.10	16.96	45.88
	12	8.69	+0.4	339.70	191.67	+3.53	+32.52	+17.22	46.77
	14	8.85	0.5	340.00	192.16	3.81	32.91	17.48	47.65
	16	9.00	0.5	340.32	192.68	4.09	33.28	17.73	48.53
	18	9.16	0.5	340.65	193.22	4.39	33.63	17.98	49.41
	20	9.32	0.6	341.00	193.79	4.69	33.95	18.22	50.29
	22	9.48	+0.6	341.37	194.38	+5.00	+34.25	+18.46	51.17
	24	9.64	0.7	341.75	194.99	5.32	34.53	18.69	52.05
	26	9.80	0.7	342.14	195.62	5.65	34.79	18.92	52.93
	28	9.96	0.7	342.55	196.28	5.99	35.04	19.15	53.81
	30	10.12	0.8	342.97	196.95	6.33	35.27	19.37	54.69
Apr.	1	10.28	+0.8	343.40	197.64	+6.68	+35.48	+19.58	55.57
	3	10.44	+0.8	343.84	198.35	+7.04	+35.66	+19.79	56.44

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

WASHINGTON MEAN TIME.

Noon.	*k*	Diameter.	*i*	*q*	*Q*	Central Meridian.	Transit of Zero Meridian.	
							Of Date.	Of Intermediate Date.
		″	°	″	°	°	h m	h m
m. 1	0.999	16.23	4.24	0.02	243.49	258.13	6 57.6	7 33.5
3	0.999	16.21	2.98	0.01	223.77	240.62	8 9.4	8 45.3
5	1.000	16.17	2.41	0.01	187.76	223.12	9 21.2	9 57.1
7	0.999	16.11	2.95	0.01	151.46	205.61	10 33.0	11 8.9
9	0.999	16.02	4.17	0.02	131.40	188.09	11 44.9	12 20.8
11	0.998	15.92	5.64	0.04	120.90	170.55	12 56.8	13 32.8
13	0.996	15.79	7.18	0.06	114.76	152.99	14 8.8	14 44.8
15	0.994	15.65	8.73	0.09	110.70	135.41	15 20.9	15 57.0
17	0.992	15.49	10.28	0.12	107.78	117.80	16 33.1	17 9.3
19	0.990	15.31	11.80	0.16	105.58	100.16	17 45.5	18 21.8
21	0.986	15.12	13.29	0.20	103.83	82.47	18 58.1	19 34.4
23	0.984	14.92	14.74	0.24	102.41	64.75	20 10.8	20 47.3
25	0.980	14.71	16.14	0.29	101.23	46.98	21 23.8	22 0.4
27	0.977	14.49	17.50	0.34	100.22	29.17	22 37.0	23 13.6
29	0.973	14.26	18.80	0.38	99.36	11.31	23 50.3	. . . . .
31	0.970	14.02	20.05	0.43	98.61	353.40	0 27.1	1 3.9
eb. 2	0.966	13.79	21.24	0.47	97.97	335.45	1 40.7	2 17.6
4	0.962	13.55	22.38	0.51	97.42	317.45	2 54.6	3 31.6
6	0.959	13.30	23.47	0.55	96.93	299.40	4 8.7	4 45.8
8	0.955	13.06	24.50	0.59	96.51	281.29	5 23.0	6 0.2
10	0.951	12.82	25.48	0.62	96.15	263.14	6 37.5	7 14.8
12	0.948	12.58	26.41	0.66	95.84	244.94	7 52.2	8 29.6
14	0.944	12.35	27.28	0.69	95.58	226.70	9 7.1	9 44.6
16	0.941	12.11	28.11	0.72	95.36	208.41	10 22.2	10 59.8
18	0.938	11.88	28.89	0.74	95.19	190.08	11 37.5	12 15.2
20	0.935	11.66	29.62	0.76	95.05	171.70	12 53.0	13 30.8
22	0.932	11.44	30.31	0.78	94.95	153.28	14 8.6	14 46.5
24	0.928	11.22	30.95	0.80	94.88	134.83	15 24.4	16 2.4
26	0.926	11.00	31.55	0.81	94.85	116.34	16 40.4	17 18.4
28	0.924	10.79	32.11	0.82	94.84	97.82	17 56.5	18 34.6
ar. 2	0.921	10.59	32.63	0.84	94.86	79.26	19 12.8	19 51.0
4	0.919	10.39	33.11	0.84	94.90	60.65	20 29.2	21 7.5
6	0.916	10.20	33.55	0.85	94.97	42.02	21 45.8	22 24.1
8	0.914	10.02	33.96	0.85	95.06	23.36	23 2.4	23 40.8
10	0.913	9.83	34.35	0.86	95.18	4.67	. . . . .	0 19.2
12	0.911	9.66	34.70	0.86	95.31	345.95	0 57.7	1 36.2
14	0.910	9.49	35.02	0.86	95.46	327.20	2 14.7	2 53.2
16	0.908	9.32	35.32	0.86	95.62	308.43	3 31.8	4 10.4
18	0.907	9.16	35.58	0.86	95.81	289.63	4 49.0	5 27.6
20	0.905	9.01	35.82	0.85	96.00	270.81	6 6.3	6 45.0
22	0.904	8.85	36.03	0.85	96.20	251.97	7 23.7	8 2.5
24	0.903	8.70	36.22	0.84	96.42	233.10	8 41.3	9 20.2
26	0.902	8.56	36.39	0.83	96.65	214.21	9 59.0	10 37.8
28	0.902	8.42	36.53	0.83	96.90	195.31	11 16.6	11 55.4
30	0.901	8.29	36.65	0.82	97.15	176.38	12 34.3	13 13.2
Apr. 1	0.901	8.16	36.76	0.81	97.41	157.43	13 52.1	14 31.1
3	0.900	8.04	36.85	0.80	97.68	138.47	15 10.1	15 49.1

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

WASHINGTON MEAN TIME.

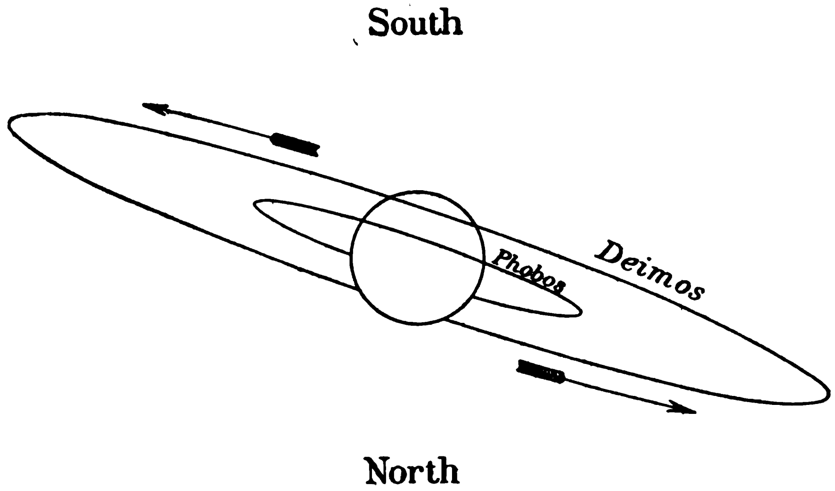
Noon.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180°$	$D_{\oplus}$	$A_{\odot}-A_{\oplus}$	$D_{\odot}$	$\odot_{♂}$
	m		°	°	°	°	°	°
Apr. 1	10.28	+0.8	343.40	197.64	+ 6.68	+35.48	+19.58	55.5
3	10.44	0.8	343.84	198.35	7.04	35.66	19.79	56.4
5	10.61	0.9	344.30	199.08	7.40	35.83	20.00	57.3
7	10.77	0.9	344.77	199.83	7.76	35.99	20.20	58.1
9	10.93	1.0	345.25	200.59	8.13	36.14	20.40	59.0
11	11.09	+1.0	345.74	201.37	+ 8.50	+36.27	+20.59	59.9
13	11.25	1.0	346.24	202.16	8.87	36.39	20.78	60.8
15	11.40	1.0	346.75	202.97	9.25	36.50	20.96	61.6
17	11.56	1.1	347.27	203.80	9.63	36.59	21.14	62.5
19	11.72	1.1	347.80	204.64	10.01	36.67	21.31	63.4
21	11.88	+1.1	348.33	205.49	+10.40	+36.74	+21.48	64.3
23	12.04	1.2	348.88	206.35	10.78	36.80	21.64	65.1
25	12.19	1.2	349.44	207.23	11.17	36.85	21.80	66.0
27	12.35	1.2	350.00	208.12	11.56	36.88	21.96	66.9
29	12.50	1.2	350.57	209.03	11.95	36.90	22.11	67.8
May 1	12.66	+1.3	351.15	209.95	+12.34	+36.91	+22.25	68.6
3	12.81	1.3	351.74	210.88	12.72	36.92	22.38	69.5
5	12.96	1.3	352.33	211.82	13.11	36.91	22.51	70.4
7	13.11	1.3	352.93	212.78	13.48	36.89	22.64	71.3
9	13.26	1.4	353.54	213.74	13.87	36.86	22.76	72.1
11	13.41	+1.4	354.15	214.72	+14.25	+36.82	+22.88	73.0
13	13.56	1.4	354.77	215.71	14.63	36.77	22.99	73.9
15	13.71	1.4	355.40	216.71	15.00	36.71	23.09	74.7
17	13.85	1.4	356.03	217.73	15.37	36.64	23.19	75.6
19	14.00	1.5	356.67	218.75	15.74	36.56	23.28	76.5
21	14.14	+1.5	357.31	219.79	+16.11	+36.48	+23.37	77.4
23	14.28	1.5	357.96	220.84	16.48	36.39	23.45	78.3
25	14.42	1.5	358.61	221.89	16.84	36.29	23.53	79.1
27	14.56	1.5	359.26	222.96	17.19	36.17	23.60	80.0
29	14.70	1.6	359.92	224.04	17.54	36.04	23.66	80.9
31	14.84	+1.6	0.58	225.13	+17.88	+35.91	+23.72	81.8
June 2	14.97	1.6	1.25	226.23	18.22	35.77	23.77	82.6
4	15.10	1.6	1.92	227.34	18.55	35.62	23.82	83.5
6	15.24	1.6	2.59	228.46	18.88	35.46	23.86	84.4
8	15.37	1.6	3.27	229.59	19.21	35.30	23.89	85.3
10	15.50	+1.6	3.95	230.73	+19.53	+35.13	+23.92	86.2
12	15.62	1.6	4.63	231.88	19.84	34.95	23.94	87.10
14	15.75	1.7	5.31	233.04	20.14	34.75	23.96	87.9
16	15.88	1.7	5.99	234.21	20.43	34.55	23.97	88.87
18	16.00	1.7	6.68	235.39	20.72	34.34	23.98	89.75
20	16.12	+1.7	7.37	236.58	+21.00	+34.12	+23.98	90.64
22	16.24	1.7	8.06	237.78	21.27	33.89	23.97	91.53
24	16.36	1.7	8.75	238.99	21.54	33.65	23.96	92.42
26	16.48	1.7	9.45	240.21	21.80	33.41	23.94	93.31
28	16.59	1.7	10.15	241.44	22.05	33.16	23.91	94.20
30	16.71	+1.8	10.84	242.67	+22.29	+32.90	+23.88	95.10
July 2	16.82	+1.8	11.53	243.92	+22.51	+32.63	+23.84	95.99

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

WASHINGTON MEAN TIME.

Noon.		*k*	Diameter.	*i*	*q*	*Q*	Central Meridian.	Transit of Zero Meridian.	
								Of Date.	Of Intermediate Date.
			″	°	″	°	°	h m	h m
Apr.	1	0.901	8.16	36.76	0.81	97.41	157.43	13 52.1	14 31.1
	3	0.900	8.04	36.85	0.80	97.68	138.47	15 10.1	15 49.1
	5	0.900	7.92	36.92	0.79	97.96	119.49	16 28.1	17 7.1
	7	0.899	7.80	36.97	0.78	98.25	100.49	17 46.2	18 25.3
	9	0.899	7.68	37.00	0.77	98.54	81.46	19 4.4	19 43.6
	11	0.899	7.57	37.02	0.76	98.84	62.42	20 22.7	21 1.8
	13	0.899	7.46	37.03	0.75	99.14	43.37	21 40.9	22 20.1
	15	0.899	7.36	37.02	0.74	99.45	24.31	22 59.2	23 38.4
	17	0.899	7.26	37.00	0.73	99.76	5.23	. . . . .	0 17.6
	19	0.900	7.16	36.97	0.72	100.08	346.14	0 56.9	1 36.1
	21	0.900	7.06	36.92	0.71	100.40	327.04	2 15.4	2 54.7
	23	0.900	6.97	36.86	0.70	100.72	307.92	3 34.0	4 13.3
	25	0.900	6.88	36.79	0.68	101.04	288.79	4 52.6	5 31.9
	27	0.901	6.80	36.70	0.67	101.36	269.64	6 11.3	6 50.7
	29	0.901	6.71	36.60	0.66	101.68	250.48	7 30.1	8 9.5
May	1	0.902	6.63	36.50	0.65	102.01	231.31	8 48.9	9 28.3
	3	0.902	6.55	36.39	0.64	102.34	212.12	10 7.7	10 47.1
	5	0.903	6.48	36.27	0.63	102.67	192.92	11 26.6	12 6.1
	7	0.904	6.40	36.14	0.62	102.99	173.71	12 45.6	13 25.1
	9	0.904	6.33	36.00	0.60	103.31	154.49	14 4.7	14 44.2
	11	0.905	6.26	35.85	0.59	103.63	135.26	15 23.7	16 3.2
	13	0.906	6.19	35.69	0.58	103.95	116.02	16 42.7	17 22.3
	15	0.907	6.12	35.53	0.57	104.27	96.76	18 1.9	18 41.5
	17	0.908	6.06	35.36	0.56	104.59	77.49	19 21.1	20 0.7
	19	0.909	6.00	35.18	0.55	104.90	58.22	20 40.3	21 20.0
	21	0.910	5.94	35.00	0.54	105.21	38.94	21 59.6	22 39.3
	23	0.910	5.88	34.81	0.53	105.51	19.65	23 19.0	23 58.6
	25	0.911	5.82	34.61	0.52	105.81	0.34	. . . . .	0 38.3
	27	0.912	5.76	34.41	0.50	106.11	341.02	1 18.0	1 57.7
	29	0.914	5.71	34.20	0.49	106.40	321.69	2 37.5	3 17.2
	31	0.915	5.66	33.99	0.48	106.69	302.35	3 57.0	4 36.7
June	2	0.916	5.61	33.77	0.47	106.98	283.00	5 16.5	5 56.3
	4	0.917	5.56	33.54	0.46	107.26	263.64	6 36.1	7 15.9
	6	0.918	5.51	33.31	0.45	107.54	244.27	7 55.7	8 35.5
	8	0.919	5.46	33.08	0.44	107.81	224.90	9 15.3	9 55.1
	10	0.920	5.42	32.84	0.43	108.08	205.52	10 35.0	11 14.9
	12	0.921	5.37	32.60	0.42	108.34	186.12	11 54.8	12 34.7
	14	0.922	5.33	32.36	0.41	108.59	166.71	13 14.6	13 54.6
	16	0.924	5.29	32.11	0.40	108.84	147.29	14 34.5	15 14.5
	18	0.925	5.25	31.85	0.40	109.08	127.86	15 54.4	16 34.3
	20	0.926	5.21	31.59	0.39	109.31	108.43	17 14.3	17 54.2
	22	0.927	5.17	31.32	0.38	109.54	88.99	18 34.2	19 14.2
	24	0.928	5.13	31.05	0.37	109.76	69.54	19 54.2	20 34.2
	26	0.930	5.09	30.78	0.36	109.97	50.07	21 14.2	21 54.2
	28	0.931	5.06	30.51	0.35	110.17	30.60	22 34.2	23 14.3
	30	0.932	5.02	30.24	0.34	110.37	11.12	23 54.3	. . . . .
July	2	0.933	4.99	29.96	0.33	110.56	351.62	0 34.4	1 14.5

APPARENT ORBITS OF THE SATELLITES OF MARS, AT DATE OF OPPOSITION, JANUARY 5, 1914, AS SEEN IN AN INVERTING TELESCOPE.



Phobos.			Deimos.		
Date.	Position Angle of Apsis.	Apparent Distance at Apsis.	Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
d	°	"	d	°	"
Jan. 1	251.9	20.8	Jan. 1	251.9	52.2
21	247.6	19.4	21	247.6	48.8
Feb. 10	245.8	16.4	Feb. 10	245.8	41.3

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

Phobos.									Deimos.					
	d	h		d	h		d	h		d	h		d	h
Jan.	1	3.7 W.	Jan.	17	21.5 E.	Feb.	3	15.1 W.	Jan.	2	12.7 W.	Jan.	30	21.7 E.
	2	6.5 E.		19	0.2 W.		4	17.9 E.		4	10.0 E.	Feb.	1	19.2 W.
	3	9.3 W.		20	3.0 E.		5	20.7 W.		6	7.5 W.		3	16.6 E.
	4	12.1 E.		21	5.8 W.		6	23.5 E.		8	4.8 E.		5	14.0 W.
	5	14.9 W.		22	8.6 E.		8	2.3 W.		10	2.3 W.		7	11.4 E.
	6	17.7 E.		23	11.4 W.		9	5.1 E.		11	23.6 E.		9	8.9 W.
	7	20.5 W.		24	14.1 E.		10	7.9 W.		13	21.0 W.		11	6.3 E.
	8	23.2 E.		25	16.9 W.		11	10.7 E.		15	18.4 E.		13	3.7 W.
	10	2.0 W.		26	19.7 E.		12	13.5 W.		17	15.8 W.		15	1.2 E.
	11	4.8 E.		27	22.5 W.		13	16.3 E.		19	13.2 E.		16	22.7 W.
	12	7.6 W.		29	1.3 E.		14	19.1 W.		21	10.7 W.		18	20.1 E.
	13	10.4 E.		30	4.1 W.		15	21.9 E.		23	8.0 E.		20	17.6 W.
	14	13.2 W.		31	6.9 E.		17	0.6 W.		25	5.5 W.		22	15.0 E.
	15	16.0 E.	Feb.	1	9.7 W.		18	3.4 E.		27	2.9 E.		24	12.5 W.
	16	18.8 W.		2	12.5 E.		19	6.2 W.		29	0.3 W.		26	10.0 E.

For Phobos every seventh eastern and western elongation is given, and for Deimos every third; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Phobos, $7^h\ 39^m\ 13^s.85$. Sidereal period of Deimos, $30^h\ 17^m\ 54^s.86$.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

WASHINGTON MEAN TIME.

Noon.		Light-Time.	Stellar Magnitude.	P	$A_\oplus+180°$	$D_\oplus$	$A_\odot+180°$	$D_\odot$
		m		°	°	°	°	°
eb.	13	50.16	−1.5	344.01	169.76	−0.70	166.20	−0.73
	20	49.81	1.5	343.46	171.36	0.63	166.80	0.70
	27	49.38	1.5	342.93	172.92	0.56	167.41	0.67
lar.	6	48.88	1.5	342.42	174.44	0.50	168.01	0.64
	13	48.31	1.6	341.95	175.91	0.43	168.61	0.61
	20	47.67	−1.6	341.51	177.33	−0.37	169.21	−0.57
	27	46.97	1.6	341.10	178.68	0.30	169.82	0.54
pr.	3	46.21	1.7	340.72	179.95	0.24	170.42	0.51
	10	45.41	1.7	340.38	181.14	0.17	171.03	0.48
	17	44.57	1.8	340.07	182.24	0.11	171.64	0.45
	24	43.70	−1.8	339.80	183.24	−0.05	172.24	−0.41
lay	1	42.80	1.8	339.56	184.12	0.00	172.85	0.38
	8	41.88	1.9	339.36	184.89	+0.05	173.46	0.35
	15	40.96	1.9	339.19	185.53	0.10	174.07	0.32
	22	40.05	2.0	339.06	186.03	0.15	174.67	0.29
	29	39.15	−2.0	338.97	186.38	+0.19	175.28	−0.25
me	5	38.28	2.1	338.92	186.58	0.23	175.89	0.22
	12	37.45	2.1	338.91	186.63	0.26	176.50	0.19
	19	36.67	2.2	338.93	186.52	0.29	177.11	0.15
	26	35.96	2.2	338.99	186.25	0.31	177.73	0.12
uly	3	35.32	−2.3	339.09	185.84	+0.32	178.34	−0.09
	10	34.76	2.3	339.23	185.29	0.33	178.95	0.06
	17	34.30	2.3	339.40	184.62	0.33	179.56	−0.02
	24	33.95	2.4	339.60	183.84	0.32	180.18	+0.01
	31	33.71	2.4	339.83	182.99	0.31	180.79	0.04
ug.	7	33.59	−2.4	340.07	182.09	+0.30	181.40	+0.08
	14	33.59	2.4	340.32	181.18	0.28	182.02	0.11
	21	33.71	2.4	340.57	180.29	0.26	182.63	0.14
	28	33.94	2.4	340.82	179.44	0.24	183.25	0.17
ept.	4	34.29	2.3	341.05	178.67	0.21	183.87	0.21
	11	34.75	−2.3	341.25	178.01	+0.19	184.48	+0.24
	18	35.31	2.3	341.41	177.48	0.17	185.10	0.27
	25	35.95	2.2	341.53	177.09	0.15	185.72	0.31
ct.	2	36.66	2.2	341.60	176.85	0.13	186.34	0.34
	9	37.44	2.2	341.62	176.78	0.12	186.96	0.37
	16	38.27	−2.1	341.60	176.87	+0.11	187.58	+0.40
	23	39.13	2.1	341.53	177.12	0.11	188.20	0.44
	30	40.02	2.0	341.40	177.52	0.11	188.82	0.47
ov.	6	40.93	2.0	341.23	178.08	0.12	189.44	0.50
	13	41.83	1.9	341.02	178.78	0.13	190.06	0.54
	20	42.72	−1.9	340.78	179.61	+0.15	190.68	+0.57
	27	43.60	1.8	340.50	180.57	0.17	191.30	0.60
ec.	4	44.44	1.8	340.20	181.64	0.20	191.92	0.63
	11	45.24	1.7	339.88	182.81	0.24	192.55	0.67
	18	46.00	1.7	339.54	184.08	0.28	193.17	0.70
	25	46.70	−1.7	339.19	185.42	+0.32	193.80	+0.73
	32	47.34	−1.7	338.84	186.84	+0.36	194.42	+0.76

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

WASHINGTON MEAN TIME.

Noon.		Equatorial Diameter.	Excess of Equat. Diameter over Polar.	*i*	*q*	*Q*	Central Meridian.		Correc for Ph
							Equatorial Region.	Great Red Spot.	
		″	″	°	″	°	°	°	°
Feb.	13	33.20	2.02	3.56	0.03	254.63	328.86	233.56	+0.
	20	33.43	2.03	4.55	0.05	254.38	352.77	204.12	0.
	27	33.72	2.05	5.51	0.08	254.06	16.77	174.76	0.
Mar.	6	34.07	2.07	6.43	0.11	253.71	40.86	145.48	0.
	13	34.47	2.09	7.30	0.14	253.35	65.04	116.29	0.
	20	34.93	2.12	8.11	0.17	253.01	89.31	87.20	+0.
	27	35.45	2.15	8.86	0.21	252.69	113.69	58.21	0.
Apr.	3	36.03	2.19	9.53	0.25	252.40	138.18	29.33	0.
	10	36.67	2.23	10.12	0.29	252.13	162.78	0.57	0.
	17	37.36	2.27	10.61	0.32	251.89	187.49	331.92	0.
	24	38.11	2.31	11.00	0.35	251.69	212.33	303.39	+0.
May	1	38.91	2.36	11.28	0.38	251.52	237.29	274.99	0.
	8	39.76	2.41	11.44	0.40	251.39	262.38	246.71	0.
	15	40.65	2.47	11.47	0.41	251.30	287.60	218.57	0.
	22	41.58	2.52	11.36	0.41	251.26	312.96	190.56	0.
	29	42.53	2.58	11.10	0.40	251.26	338.46	162.69	+0.
June	5	43.50	2.64	10.69	0.38	251.32	4.09	134.95	0.
	12	44.46	2.70	10.13	0.35	251.43	29.85	107.35	0.
	19	45.41	2.76	9.41	0.31	251.61	55.73	79.87	0.
	26	46.31	2.81	8.54	0.26	251.86	81.73	52.50	0.
July	3	47.15	2.86	7.51	0.20	252.20	107.83	25.24	+0.
	10	47.91	2.91	6.35	0.14	252.69	134.02	358.06	0.
	17	48.55	2.95	5.07	0.09	253.39	160.27	330.95	0.
	24	49.05	2.98	3.68	0.05	254.49	186.56	303.88	0.
	31	49.40	3.00	2.22	0.02	256.88	212.86	276.82	+0.
Aug.	7	49.58	3.01	0.72	0.00	268.22	239.14	249.73	0.
	14	49.58	3.01	0.86	0.00	58.66	265.35	222.58	0.
	21	49.40	3.00	2.35	0.02	67.68	291.47	195.34	−0.
	28	49.06	2.98	3.81	0.05	69.90	317.47	167.98	0.
Sept.	4	48.56	2.95	5.19	0.10	71.00	343.32	140.47	0.
	11	47.92	2.91	6.47	0.15	71.71	9.00	112.80	−0.
	18	47.17	2.86	7.62	0.21	72.22	34.50	84.94	0.
	25	46.33	2.81	8.63	0.26	72.60	59.80	56.88	0.
Oct.	2	45.42	2.76	9.49	0.31	72.88	84.90	28.62	0.
	9	44.48	2.70	10.18	0.35	73.08	109.80	0.17	0.
	16	43.52	2.64	10.71	0.38	73.20	134.51	331.52	−0.
	23	42.56	2.58	11.09	0.40	73.25	159.03	302.68	0.
	30	41.61	2.53	11.30	0.40	73.25	183.38	273.68	0.
Nov.	6	40.69	2.47	11.36	0.40	73.20	207.57	244.52	0.
	13	39.81	2.42	11.29	0.38	73.11	231.62	215.21	0.
	20	38.98	2.37	11.08	0.36	72.98	255.55	185.77	−0.
	27	38.20	2.32	10.74	0.33	72.82	279.36	156.23	0.
Dec.	4	37.48	2.27	10.29	0.30	72.64	303.07	126.59	0.
	11	36.81	2.23	9.74	0.27	72.45	326.71	96.87	0.
	18	36.20	2.20	9.10	0.23	72.25	350.29	67.08	0.
	25	35.66	2.16	8.38	0.19	72.06	13.81	37.25	−0.
	32	35.18	2.13	7.59	0.15	71.89	37.30	7.39	−0.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, EQUATORIAL REGION.

WASHINGTON MEAN TIME.

Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.	
	d	h	m	h	m		d	h	m	h	m		d	h	m	h	m
Feb.	17	3	17.33	9	50.63	June	3	18	21.08	9	50.47	Sept.	18	8	54.32	9	50.50
	19	4	30.46				5	19	33.41				20	10	6.83		
	21	5	43.58				7	20	45.73				22	11	19.36		
	23	6	56.69				9	21	58.03				24	12	31.92		
	25	8	9.79				11	23	10.31				26	13	44.51		
	27	9	22.88	9	50.62		14	0	22.58	9	50.45		28	14	57.13	9	50.53
Mar.	1	10	35.95				16	1	34.83				30	16	9.77		
	3	11	49.01				18	2	47.07			Oct.	2	17	22.44		
	5	13	2.06				20	3	59.29				4	18	35.14		
	7	14	15.09				22	5	11.50				6	19	47.86		
	9	15	28.11	9	50.60		24	6	23.69	9	50.44		8	21	0.61	9	50.55
	11	16	41.12				26	7	35.87				10	22	13.39		
	13	17	54.12				28	8	48.03				12	23	26.19		
	15	19	7.10				30	10	0.18				15	0	39.02		
	17	20	20.06			July	2	11	12.32				17	1	51.87		
	19	21	33.01	9	50.59		4	12	24.44	9	50.42		19	3	4.75	9	50.58
	21	22	45.95				6	13	36.55				21	4	17.65		
	23	23	58.87				8	14	48.65				23	5	30.57		
	26	1	11.77				10	16	0.74				25	6	43.51		
	28	2	24.66				12	17	12.83				27	7	56.47		
	30	3	37.54	9	50.57		14	18	24.90	9	50.41		29	9	9.45	9	50.60
Apr.	1	4	50.40				16	19	36.96				31	10	22.46		
	3	6	3.24				18	20	49.02			Nov.	2	11	35.49		
	5	7	16.07				20	22	1.07				4	12	48.54		
	7	8	28.88				22	23	13.12				6	14	1.60		
	9	9	41.68	9	50.56		25	0	25.16	9	50.41		8	15	14.68	9	50.62
	11	10	54.47				27	1	37.20				10	16	27.78		
	13	12	7.24				29	2	49.24				12	17	40.90		
	15	13	19.99				31	4	1.28				14	18	54.04		
	17	14	32.73			Aug.	2	5	13.32				16	20	7.19		
	19	15	45.45	9	50.54		4	6	25.36	9	50.41		18	21	20.35	9	50.63
	21	16	58.15				6	7	37.40				20	22	33.53		
	23	18	10.84				8	8	49.44				22	23	46.72		
	25	19	23.51				10	10	1.50				25	0	59.92		
	27	20	36.16				12	11	13.57				27	2	13.13		
	29	21	48.80	9	50.53		14	12	25.65	9	50.42		29	3	26.36	9	50.65
May	1	23	1.42				16	13	37.75			Dec.	1	4	39.60		
	4	0	14.02				18	14	49.86				3	5	52.85		
	6	1	26.61				20	16	1.99				5	7	6.11		
	8	2	39.18				22	17	14.14				7	8	19.38		
	10	3	51.74	9	50.51		24	18	26.32	9	50.44		9	9	32.66	9	50.66
	12	5	4.28				26	19	38.52				11	10	45.95		
	14	6	16.80				28	20	50.74				13	11	59.25		
	16	7	29.31				30	22	2.99				15	13	12.56		
	18	8	41.80			Sept.	1	23	15.26				17	14	25.87		
	20	9	54.27	9	50.49		4	0	27.55	9	50.46		19	15	39.19	9	50.66
	22	11	6.72				6	1	39.87				21	16	52.51		
	24	12	19.16				8	2	52.21				23	18	5.84		
	26	13	31.58				10	4	4.58				25	19	19.18		
	28	14	43.98				12	5	16.97				27	20	32.52		
	30	15	56.36	9	50.48		14	6	29.39	9	50.49		29	21	45.86	9	50.67
June	1	17	8.73				16	7	41.84				31	22	59.21		

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, GREAT RED SPOT.

WASHINGTON MEAN TIME.

Transit of Great Red Spot.				Interval between Successive Transits.		Transit of Great Red Spot.				Interval between Successive Transits.		Transit of Great Red Spot.				Interval between Successive Transits.	
	d	h	m	h	m		d	h	m	h	m		d	h	m	h	m
Feb.	15	5	8.19	9	55.80	June	2	18	37.69	9	55.64	Sept.	18	7	35.54	9	55.67
	17	6	47.21				4	20	15.89				20	9	13.90		
	19	8	26.23				6	21	54.07				22	10	52.30		
	21	10	5.23				8	23	32.24				24	12	30.73		
	23	11	44.22				11	1	10.39				26	14	9.19		
	25	13	23.19	9	55.79		13	2	48.53	9	55.63		28	15	47.67	9	55.70
	27	15	2.14				15	4	26.65				30	17	26.17		
Mar.	1	16	41.09				17	6	4.75			Oct.	2	19	4.70		
	3	18	20.02				19	7	42.84				4	20	43.26		
	5	19	58.94				21	9	20.91				6	22	21.85		
	7	21	37.85	9	55.78		23	10	58.96	9	55.61		9	0	0.47	9	55.7
	9	23	16.74				25	12	37.00				11	1	39.11		
	12	0	55.62				27	14	15.03				13	3	17.78		
	14	2	34.48				29	15	53.04				15	4	56.47		
	16	4	13.33			July	1	17	31.04				17	6	35.19		
	18	5	52.16	9	55.76		3	19	9.03	9	55.60		19	8	13.94	9	55.7
	20	7	30.98				5	20	47.00				21	9	52.71		
	22	9	9.78				7	22	24.96				23	11	31.50		
	24	10	48.57				10	0	2.91				25	13	10.31		
	26	12	27.34				12	1	40.85				27	14	49.14		
	28	14	6.10	9	55.75		14	3	18.78	9	55.59		29	16	28.00	9	55.7
	30	15	44.84				16	4	56.70				31	18	6.88		
Apr.	1	17	23.57				18	6	34.62			Nov.	2	19	45.78		
	3	19	2.28				20	8	12.53				4	21	24.70		
	5	20	40.98				22	9	50.43				6	23	3.63		
	7	22	19.66	9	55.73		24	11	28.32	9	55.58		9	0	42.58	9	55.79
	9	23	58.32				26	13	6.22				11	2	21.55		
	12	1	36.97				28	14	44.11				13	4	0.55		
	14	3	15.60				30	16	22.00				15	5	39.56		
	16	4	54.21			Aug.	1	17	59.89				17	7	18.58		
	18	6	32.81	9	55.72		3	19	37.78	9	55.58		19	8	57.61	9	55.81
	20	8	11.39				5	21	15.68				21	10	36.66		
	22	9	49.96				7	22	53.58				23	12	15.73		
	24	11	28.51				10	0	31.49				25	13	54.81		
	26	13	7.04				12	2	9.41				27	15	33.90		
	28	14	45.56	9	55.70		14	3	47.34	9	55.59		29	17	13.00	9	55.82
	30	16	24.06				16	5	25.29			Dec.	1	18	52.12		
May	2	18	2.54				18	7	3.26				3	20	31.25		
	4	19	41.01				20	8	41.25				5	22	10.39		
	6	21	19.46				22	10	19.26				7	23	49.53		
	8	22	57.89	9	55.68		24	11	57.29	9	55.61		10	1	28.69	9	55.83
	11	0	36.30				26	13	35.34				12	3	7.86		
	13	2	14.70				28	15	13.41				14	4	47.04		
	15	3	53.08				30	16	51.51				16	6	26.23		
	17	5	31.44			Sept.	1	18	29.63				18	8	5.42		
	19	7	9.78	9	55.67		3	20	7.78	9	55.63		20	9	44.61	9	55.84
	21	8	48.10				5	21	45.95				22	11	23.81		
	23	10	26.41				7	23	24.15				24	13	3.02		
	25	12	4.70				10	1	2.37				26	14	42.23		
	27	13	42.97				12	2	40.62				28	16	21.44		
	29	15	21.23	9	55.65		14	4	18.90	9	55.66		30	18	0.66	9	55.84
	31	16	59.47				16	5	57.21				32	19	39.88		

Jupiter is in opposition August 10, 1914, but at this date the Earth is very near the planes of the orbits of the satellites, and hence the apparent orbits approximate straight lines. For this reason the diagram of the apparent orbits is not given.

The ephemeris of the four brighter satellites of Jupiter is given on pages 634–655, each month occupying two pages, which contain, respectively, the times of the phenomena and the diagrams of the configurations. The latter are given for each day, Jupiter being represented by a light disk, ○, in the center of the page, and the relative positions of the satellites at the Washington time stated above the diagrams being indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot, according as the motion of the satellite at the instant in question is toward the east or toward the west, the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other, according to their apparent latitudes. If, at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk ○, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, ●, at the right-hand side of the page. In both cases the annexed numerals serve to point out which satellites are thus rendered invisible.

The differential coordinates of the sixth and seventh satellites will be found on pages 632 and 633.

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d		d	h	m	s		d
I.	1	18	28	35.945	=	1.769 860 48	V.	0	11	57	27.635	=	0.498 236 52
II.	3	13	17	53.735	=	3.554 094 16	VI.					=	266.00
III.	7	3	59	35.854	=	7.166 387 20	VII.					=	276.67
IV.	16	18	5	6.928	=	16.753 552 41							

SATELLITE V.

WASHINGTON MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATI

	d	h			d	h			d	h			d	h
May	20	14.9	E.	Aug.	18	6.7	E.	May	20	8.9	W.	Aug.	18	12.7
	30	14.0	E.		28	17.8	E.		30	8.0	W.		28	11.8
June	9	13.1	E.	Sept.	7	16.9	E.	June	9	7.1	W.	Sept.	7	10.9
	19	12.2	E.		17	16.0	E.		19	6.2	W.		17	10.0
	29	11.3	E.		27	15.1	E.		29	17.3	W.		27	9.1
July	9	10.4	E.	Oct.	7	14.2	E.	July	9	16.4	W.	Oct.	7	8.2
	19	9.5	E.		17	13.4	E.		19	15.4	W.		17	7.4
	29	8.6	E.		27	12.5	E.		29	14.5	W.		27	6.6
Aug.	8	7.6	E.	Nov.	6	11.7	E.	Aug.	8	13.6	W.	Nov.	6	5.7

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

	d	h m		d	h m		d	h m		d	h
Feb.	20	17 44.4	May	11	9 55.7	July	30	0 16.3	Oct.	17	14
	22	12 14.7		13	4 24.2		31	18 42.3		19	8
	24	6 45.0		14	22 52.7	Aug.	2	13 8.3		21	3
	26	1 15.3		16	17 21.1		4	7 34.3		22	21
	27	19 45.5		18	11 49.4		6	2 0.2		24	16
Mar.	1	14 15.7		20	6 17.7		7	20 26.2		26	10
	3	8 45.9		22	0 45.9		9	14 52.1		28	5
	5	3 16.1		23	19 14.1		11	9 18.1		29	23
	6	21 46.2		25	13 42.2		13	3 44.0		31	18
	8	16 16.3		27	8 10.2		14	22 10.0	Nov.	2	12
	10	10 46.4		29	2 38.1		16	16 36.0		4	7
	12	5 16.5		30	21 6.0		18	11 2.0		6	1
	13	23 46.5	June	1	15 33.8		20	5 28.0		7	19
	15	18 16.5		3	10 1.5		21	23 54.1		9	14
	17	12 46.5		5	4 29.2		23	18 20.2		11	8
	19	7 16.4		6	22 56.8		25	12 46.3		13	3
	21	1 46.3		8	17 24.3		27	7 12.5		14	21
	22	20 16.2		10	11 51.8		29	1 38.7		16	16
	24	14 46.0		12	6 19.2		30	20 5.0		18	10
	26	9 15.8		14	0 46.5	Sept.	1	14 31.3		20	5
	28	3 45.5		15	19 13.8		3	8 57.6		21	23
	29	22 15.2		17	13 41.0		5	3 24.0		23	18
	31	16 44.9		19	8 8.1		6	21 50.4		25	12
Apr.	2	11 14.6		21	2 35.2		8	16 16.9		27	7
	4	5 44.2		22	21 2.2		10	10 43.4		29	1
	6	0 13.8		24	15 29.1		12	5 10.0		30	20
	7	18 43.3		26	9 56.0		13	23 36.7	Dec.	2	14
	9	13 12.8		28	4 22.8		15	18 3.4		4	9
	11	7 42.3		29	22 49.5		17	12 30.2		6	3
	13	2 11.7	July	1	17 16.2		19	6 57.1		7	22
	14	20 41.1		3	11 42.8		21	1 24.1		9	16
	16	15 10.4		5	6 9.4		22	19 51.2		11	11
	18	9 39.7		7	0 35.9		24	14 18.2		13	5
	20	4 9.0		8	19 2.4		26	8 45.4		15	0
	21	22 38.2		10	13 28.8		28	3 12.7		16	18
	23	17 7.3		12	7 55.1		29	21 40.0		18	13
	25	11 36.4		14	2 21.4	Oct.	1	16 7.4		20	7
	27	6 5.4		15	20 47.6		3	10 34.9		22	2
	29	0 34.4		17	15 13.8		5	5 2.4		23	20
	30	19 3.3		19	9 40.0		6	23 30.0		25	15
May	2	13 32.2		21	4 6.1		8	17 57.7		27	9
	4	8 1.0		22	22 32.2		10	12 25.5		29	4
	6	2 29.8		24	16 58.3		12	6 53.3		30	21
	7	20 58.5		26	11 24.3		14	1 21.2			
	9	15 27.1		28	5 50.3		15	19 49.2			

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

	d	h	m		d	h	m		d	h	m		d	h	m
Feb.	21	7	4.9	May	14	2	12.7	Aug.	3	17	26.7	Oct.	24	8	30.8
	24	20	29.3		17	15	29.2		7	6	33.6		27	21	47.7
	28	9	53.7		21	4	45.1		10	19	40.4		31	11	6.0
Mar.	3	23	17.7		24	18	0.6		14	8	47.4	Nov.	4	0	24.1
	7	12	41.6		28	7	15.4		17	21	54.3		7	13	43.8
	11	2	5.0		31	20	29.9		21	11	1.6		11	3	3.0
	14	15	28.4	June	4	9	43.7		25	0	8.9		14	16	23.7
	18	4	51.3		7	22	57.1		28	13	16.8		18	5	44.0
	21	18	14.2		11	12	9.9	Sept.	1	2	24.7		21	19	5.8
	25	7	36.6		15	1	22.2		4	15	33.4		25	8	26.9
	28	20	58.8		18	14	33.9		8	4	42.1		28	21	49.6
Apr.	1	10	20.6		22	3	45.1		11	17	51.7	Dec.	2	11	11.5
	4	23	42.2		25	16	55.8		15	7	1.4		6	0	35.0
	8	13	3.3		29	6	6.0		18	20	12.1		9	13	57.8
	12	2	24.1	July	2	19	15.7		22	9	22.8		13	3	22.0
	15	15	44.6		6	8	25.0		25	22	34.7		16	16	45.5
	19	5	4.6		9	21	33.8		29	11	46.7		20	6	10.4
	22	18	24.3		13	10	42.2	Oct.	3	0	59.9		23	19	34.6
	26	7	43.4		16	23	50.3		6	14	13.1		27	9	0.2
	29	21	2.2		20	12	58.0		10	3	27.6		30	22	24.9
May	3	10	20.5		24	2	5.6		13	16	42.1				
	6	23	38.4		27	15	12.8		17	5	58.0				
	10	12	55.8		31	4	19.8		20	19	13.7				

SATELLITE III.

	d	h	m		d	h	m		d	h	m		d	h	m
Feb.	24	4	28.0	May	14	3	25.7	July	31	18	54.1	Oct.	18	8	56.9
Mar.	3	8	55.1		21	7	22.9	Aug.	7	22	10.2		25	12	48.8
	10	13	20.8		28	11	15.2		15	1	26.7	Nov.	1	16	45.3
	17	17	45.3	June	4	15	2.9		22	4	43.5		8	20	46.4
	24	22	7.6		11	18	46.1		29	8	2.4		16	0	51.9
Apr.	1	2	27.9		18	22	24.9	Sept.	5	11	23.2		23	5	1.8
	8	6	45.2		26	1	59.6		12	14	47.3		30	9	14.7
	15	10	59.6	July	3	5	29.5		19	18	15.6	Dec.	7	13	31.0
	22	15	11.0		10	8	55.8		26	21	48.4		14	17	49.6
	29	19	19.3		17	12	17.9	Oct.	4	1	26.6		21	22	10.9
May	6	23	24.6		24	15	37.0		11	5	9.2		29	2	34.6

SATELLITE IV.

	d	h	m		d	h	m		d	h	m		d	h	m
Feb.	16	0	53.3	May	11	3	36.1	Aug.	2	11	23.8	Oct.	24	16	9.3
Mar.	4	21	31.2		27	21	20.8		19	1	34.3	Nov.	10	10	10.1
	21	17	50.2	June	13	14	10.2	Sept.	4	16	0.3		27	5	1.9
Apr.	7	13	42.5		30	6	1.0		21	7	6.9	Dec.	14	0	36.9
	24	9	1.0	July	16	21	0.4	Oct.	7	23	7.8		30	20	46.2

DIFFERENTIAL COORDINATES OF SATELLITE VI.

Washington Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Washington Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Washington Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$
	m s	′		m s	′		m s	′
Mar. 2	+3 6	−13.8	June 12	−2 37	− 3.5	Sept. 22	+3 26	+ 1.8
4	3 4	14.1	14	2 45	2.8	24	3 34	+ 0.8
6	3 2	14.4	16	2 53	2.1	26	3 41	− 0.1
8	3 0	14.7	18	3 1	1.3	28	3 47	1.1
10	2 57	14.9	20	3 8	− 0.6	30	3 53	2.0
12	+2 54	−15.1	22	−3 15	+ 0.2	Oct. 2	+3 58	− 3.0
14	2 51	15.3	24	3 21	1.0	4	4 2	3.9
16	2 47	15.5	26	3 27	1.8	6	4 6	4.8
18	2 44	15.6	28	3 32	2.6	8	4 9	5.7
20	2 40	15.8	30	3 36	3.4	10	4 11	6.5
22	+2 37	−15.9	July 2	−3 39	+ 4.2	12	+4 13	− 7.3
24	2 33	16.0	4	3 42	5.0	14	4 14	8.1
26	2 29	16.1	6	3 44	5.8	16	4 14	8.8
28	2 25	16.1	8	3 45	6.6	18	4 14	9.5
30	2 20	16.2	10	3 45	7.4	20	4 13	10.2
Apr. 1	+2 15	−16.2	12	−3 44	+ 8.2	22	+4 12	−10.9
3	2 10	16.2	14	3 42	9.0	24	4 11	11.5
5	2 5	16.1	16	3 39	9.7	26	4 9	12.1
7	1 59	16.1	18	3 35	10.4	28	4 7	12.6
9	1 53	16.0	20	3 30	11.1	30	4 4	13.1
11	+1 47	−15.9	22	−3 24	+11.8	Nov. 1	+4 1	−13.6
13	1 41	15.8	24	3 16	12.4	3	3 58	14.1
15	1 35	15.7	26	3 7	13.0	5	3 54	14.5
17	1 29	15.6	28	2 58	13.5	7	3 50	14.9
19	1 22	15.4	30	2 48	13.9	9	3 46	15.2
21	+1 15	−15.2	Aug. 1	−2 37	+14.3	11	+3 42	−15.5
23	1 8	15.0	3	2 25	14.6	13	3 37	15.8
25	1 1	14.8	5	2 12	14.9	15	3 32	16.0
27	0 53	14.5	7	1 58	15.1	17	3 27	16.2
29	0 45	14.2	9	1 44	15.2	19	3 22	16.4
May 1	+0 37	−13.9	11	−1 29	+15.2	21	+3 16	−16.5
3	0 28	13.6	13	1 13	15.2	23	3 10	16.6
5	0 20	13.3	15	0 57	15.1	25	3 4	16.7
7	0 11	13.0	17	0 41	14.9	27	2 58	16.7
9	+0 3	12.6	19	0 25	14.6	29	2 52	16.7
11	−0 6	−12.2	21	−0 8	+14.3	Dec. 1	+2 46	−16.6
13	0 15	11.8	23	+0 9	13.9	3	2 40	16.5
15	0 24	11.4	25	0 25	13.4	5	2 34	16.4
17	0 34	10.9	27	0 41	12.8	7	2 27	16.2
19	0 43	10.5	29	0 57	12.2	9	2 21	16.0
21	−0 53	−10.0	31	+1 13	+11.5	11	+2 14	−15.8
23	1 2	9.5	Sept. 2	1 28	10.8	13	2 8	15.6
25	1 12	9.0	4	1 43	10.0	15	2 1	15.4
27	1 22	8.5	6	1 57	9.2	17	1 55	15.2
29	1 32	7.9	8	2 10	8.4	19	1 48	14.9
31	−1 42	− 7.3	10	+2 23	+ 7.5	21	+1 41	−14.6
June 2	1 51	6.7	12	2 35	6.6	23	1 34	14.3
4	2 1	6.1	14	2 47	5.7	25	1 27	13.9
6	2 10	5.5	16	2 58	4.8	27	1 20	13.5
8	2 19	4.9	18	3 8	3.8	29	1 13	13.1
10	−2 28	− 4.2	20	+3 17	+ 2.8	31	+1 6	−12.7

DIFFERENTIAL COORDINATES OF SATELLITE VII.

hing- Mean on.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Washington Mean Noon.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Washington Mean Noon.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$
	m s	′		m s	′		m s	′
r. 2	−0 17	+25.1	June 12	+3 19	+ 8.4	Sept. 22	−3 52	+ 2.6
4	0 12	25.6	14	3 16	6.6	24	3 47	4.0
6	0 7	26.1	16	3 12	4.7	26	3 41	5.4
8	−0 2	26.6	18	3 6	2.8	28	3 35	6.7
10	+0 3	27.0	20	2 59	+ 0.9	30	3 29	8.0
12	+0 8	+27.4	22	+2 52	− 1.1	Oct. 2	−3 23	+ 9.2
14	0 14	27.8	24	2 44	3.1	4	3 16	10.4
16	0 19	28.2	26	2 34	5.1	6	3 10	11.6
18	0 25	28.5	28	2 23	7.1	8	3 3	12.7
20	0 30	28.8	30	2 11	9.1	10	2 56	13.8
22	+0 36	+29.1	July 2	+1 58	−11.0	12	−2 49	+14.8
24	0 41	29.4	4	1 45	12.9	14	2 42	15.8
26	0 47	29.6	6	1 31	14.7	16	2 35	16.8
28	0 52	29.8	8	1 17	16.5	18	2 28	17.8
30	0 58	30.0	10	1 2	18.2	20	2 21	18.7
r. 1	+1 4	+30.2	12	+0 46	−19.7	22	−2 14	+19.6
3	1 9	30.3	14	0 30	21.1	24	2 6	20.5
5	1 15	30.5	16	+0 13	22.5	26	1 59	21.4
7	1 20	30.6	18	−0 4	23.7	28	1 52	22.2
9	1 26	30.7	20	0 21	24.8	30	1 45	23.0
11	+1 31	+30.8	22	−0 38	−25.8	Nov. 1	−1 37	+23.7
13	1 37	30.8	24	0 55	26.6	3	1 29	24.4
15	1 42	30.8	26	1 12	27.3	5	1 22	25.1
17	1 48	30.8	28	1 28	27.8	7	1 15	25.8
19	1 53	30.7	30	1 44	28.1	9	1 8	26.4
21	+1 58	+30.6	Aug. 1	−2 0	−28.3	11	−1 1	+27.0
23	2 3	30.5	3	2 15	28.3	13	0 54	27.5
25	2 9	30.4	5	2 29	28.1	15	0 47	28.0
27	2 14	30.2	7	2 43	27.8	17	0 40	28.4
29	2 20	30.0	9	2 56	27.3	19	0 33	28.8
y 1	+2 25	+29.8	11	−3 8	−26.7	21	−0 26	+29.2
3	2 30	29.5	13	3 19	26.0	23	0 19	29.5
5	2 35	29.2	15	3 29	25.1	25	0 12	29.8
7	2 40	28.8	17	3 38	24.1	27	−0 5	30.0
9	2 45	28.3	19	3 46	23.0	29	+0 1	30.2
11	+2 50	+27.7	21	−3 53	−21.7	Dec. 1	+0 8	+30.3
13	2 55	27.1	23	3 59	20.4	3	0 14	30.4
15	3 0	26.4	25	4 4	19.0	5	0 20	30.5
17	3 4	25.6	27	4 8	17.5	7	0 26	30.5
19	3 8	24.7	29	4 12	16.0	9	0 32	30.5
21	+3 12	+23.8	31	−4 15	−14.5	11	+0 38	+30.4
23	3 15	22.8	Sept. 2	4 16	12.9	13	0 44	30.3
25	3 18	21.8	4	4 16	11.3	15	0 49	30.2
27	3 21	20.7	6	4 16	9.7	17	0 54	30.1
29	3 23	19.4	8	4 15	8.1	19	0 59	29.9
31	+3 24	+18.1	10	−4 13	− 6.5	21	+1 4	+29.7
ne 2	3 25	16.7	12	4 11	4.9	23	1 9	29.5
4	3 25	15.2	14	4 8	3.4	25	1 14	29.3
6	3 25	13.6	16	4 5	1.9	27	1 18	29.0
8	3 24	11.9	18	4 1	− 0.4	29	1 23	28.7
10	+3 22	+10.2	20	−3 57	+ 1.1	31	+1 27	+28.4

WASHINGTON MEAN TIME.

FEBRUARY.

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from the beginning of the year to February 19.

d	h	m	s				d	h	m	s				d	h	m	s			
20	16	3	41	I.	Ec.	Dis.	24	0	15	58	III.	Ec.	Dis.	26	14	52		II.	Sh.	E
	18	54		I.	Oc.	Re.		3	30		IV.	Sh.	In.		16	11		II.	Tr.	E
21	4	33	12	II.	Ec.	Dis.		5	0	46	I.	Ec.	Dis.		20	48		I.	Sh.	In
	8	32		II.	Oc.	Re.		6	18		III.	Oc.	Re.		21	26		I.	Tr.	In
	13	22		I.	Sh.	In.		7	55		I.	Oc.	Re.		23	7		I.	Sh.	E
	13	56		I.	Tr.	In.		8	2		IV.	Sh.	Eg.		23	46		I.	Tr.	E
	15	42		I.	Sh.	Eg.		9	20		IV.	Tr.	In.	27	14	7		III.	Sh.	In
	16	16		I.	Tr.	Eg.		13	56		IV.	Tr.	Eg.		16	47		III.	Tr.	In
22	10	32	11	I.	Ec.	Dis.		17	50	45	II.	Ec.	Dis.		17	46		III.	Sh.	E
	13	25		I.	Oc.	Re.		21	57		II.	Oc.	Re.		17	57	50	I.*	Ec.	Di
	22	39		II.	Sh.	In.	25	2	19		I.	Sh.	In.		20	28		III.	Tr.	E
	23	51		II.	Tr.	In.		2	56		I.	Tr.	In.		20	56		I.	Oc.	Re
23	1	34		II.	Sh.	Eg.		4	39		I.	Sh.	Eg.	28	7	8	25	II.	Ec.	Di
	2	45		II.	Tr.	Eg.		5	16		I.	Tr.	Eg.		11	21		II.	Oc.	Re
	7	50		I.	Sh.	In.		23	29	14	I.	Ec.	Dis.		15	16		I.	Sh.	In.
	8	26		I.	Tr.	In.	26	2	25		I.	Oc.	Re.		15	56		I.	Tr.	In.
	10	10		I.	Sh.	Eg.		11	58		II.	Sh.	In.		17	36		I.	Sh.	Eg.
	10	46		I.	Tr.	Eg.		13	16		II.	Tr.	In.		18	16		I.	Tr.	Eg.

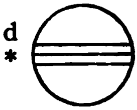
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

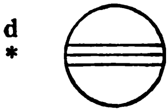
FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

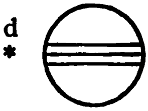
I



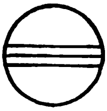
III.



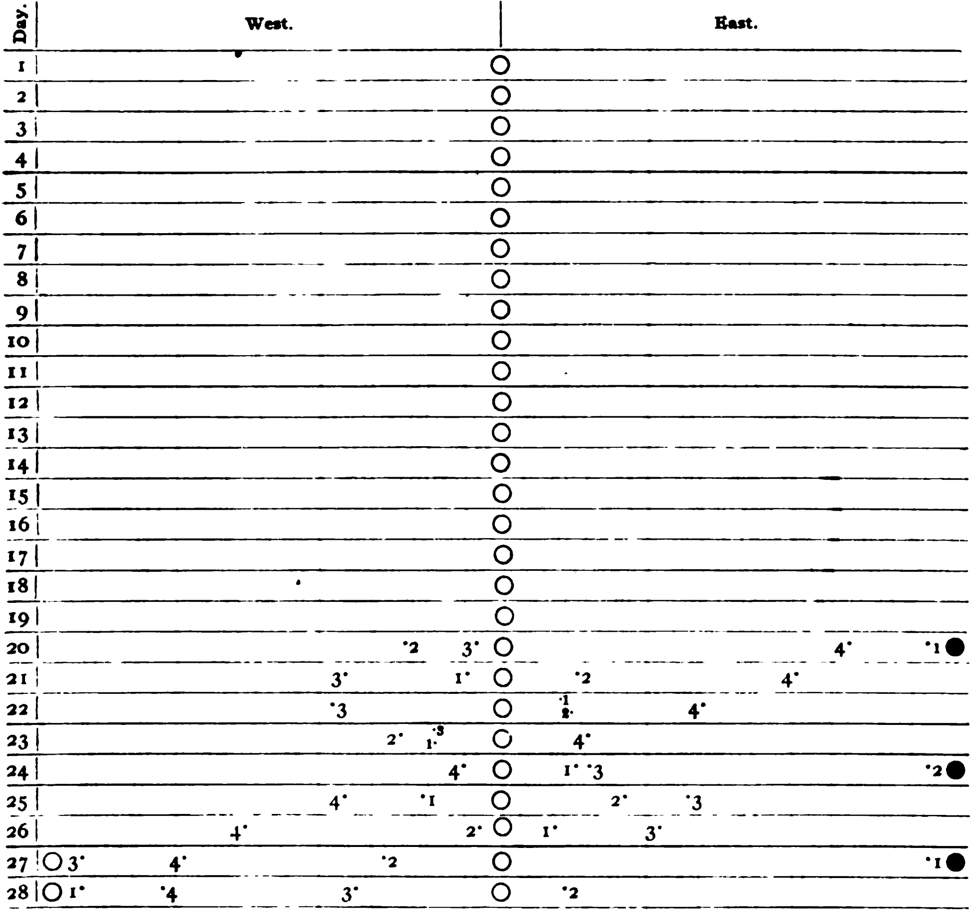
II.



IV. No Eclipse.



Configurations at 18h 0m for an Inverting Telescope.



WASHINGTON MEAN TIME.

MARCH.

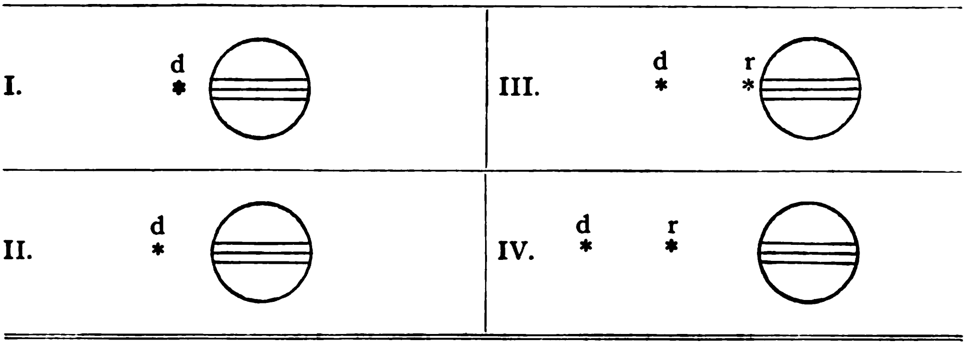
d	h	m	s			
1	12	26	20	I.	Ec.	Dis.
	15	26		I.	Oc.	Re.
2	1	16		II.	Sh.	In.
	2	41		II.	Tr.	In.
	4	10		II.	Sh.	Eg.
	5	36		II.	Tr.	Eg.
	9	44		I.	Sh.	In.
	10	27		I.	Tr.	In.
	12	4		I.	Sh.	Eg.
	12	47		I.	Tr.	Eg.
3	4	15	14	III.	Ec.	Dis.
	6	54	53	I.	Ec.	Dis.
	9	56		I.	Oc.	Re.
	10	46		III.	Oc.	Re.
	20	25	52	II.	Ec.	Dis.
4	0	45		II.	Oc.	Re.
	4	13		I.	Sh.	In.
	4	57		I.	Tr.	In.
	6	33		I.	Sh.	Eg.
	7	17		I.	Tr.	Eg.
	12	23	20	IV.	Ec.	Dis.
	16	47	32	IV.	Ec.	Re.
	19	11		IV.	Oc.	Dis.
	23	51		IV.	Oc.	Re.
5	1	23	22	I.	Ec.	Dis.
	4	26		I.	Oc.	Re.
	14	34		II.	Sh.	In.
	16	6		II.	Tr.	In.
	17	29		II.*	Sh.	Eg.
	19	1		II.	Tr.	Eg.
	22	41		I.	Sh.	In.
	23	27		I.	Tr.	In.
6	1	1		I.	Sh.	Eg.
	1	47		I.	Tr.	Eg.
	18	6		III.	Sh.	In.
	19	51	57	I.	Ec.	Dis.
	21	14		III.	Tr.	In.
	21	46		III.	Sh.	Eg.
	22	56		I.	Oc.	Re.
7	0	55		III.	Tr.	Eg.
	9	43	25	II.	Ec.	Dis.
	14	9		II.	Oc.	Re.
	17	10		I.	Sh.	In.
	17	57		I.	Tr.	In.
	19	30		I.	Sh.	Eg.
	20	17		I.	Tr.	Eg.
8	14	20	26	I.	Ec.	Dis.
	17	26		I.*	Oc.	Re.
9	3	52		II.	Sh.	In.
	5	30		II.	Tr.	In.
	6	46		II.	Sh.	Eg.
	8	25		II.	Tr.	Eg.
	11	38		I.	Sh.	In.
	12	27		I.	Tr.	In.
	13	58		I.	Sh.	Eg.
	14	47		I.	Tr.	Eg.
10	8	14	37	III.	Ec.	Dis.
	8	48	59	I.	Ec.	Dis.
	11	56		I.	Oc.	Re.
	15	12		III.	Oc.	Re.
	23	0	48	II.	Ec.	Dis.
11	3	33		II.	Oc.	Re.
	6	7		I.	Sh.	In.
	6	57		I.	Tr.	In.
	8	26		I.	Sh.	Eg.
	9	17		I.	Tr.	Eg.
12	3	17	27	I.	Ec.	Dis.
	6	26		I.	Oc.	Re.
	17	10		II.*	Sh.	In.
	18	55		II.	Tr.	In.
	20	5		II.	Sh.	Eg.
	21	36		IV.	Sh.	In.
	21	50		II.	Tr.	Eg.
13	0	35		I.	Sh.	In.
	1	27		I.	Tr.	In.
	2	12		IV.	Sh.	Eg.
	2	55		I.	Sh.	Eg.
	3	47		I.	Tr.	Eg.
	5	52		IV.	Tr.	In.
	10	35		IV.	Tr.	Eg.
	21	46	1	I.	Ec.	Dis.
	22	6		III.	Sh.	In.
14	0	57		I.	Oc.	Re.
	1	38		III.	Tr.	In.
	1	46		III.	Sh.	Eg.
	5	20		III.	Tr.	Eg.
	12	18	13	II.	Ec.	Dis.
	16	56		II.	Oc.	Re.
	19	4		I.	Sh.	In.
	19	57		I.	Tr.	In.
	21	24		I.	Sh.	Eg.
	22	17		I.	Tr.	Eg.
15	16	14	30	I.	Ec.	Dis.
	19	27		I.	Oc.	Re.
16	6	28		II.	Sh.	In.
	8	19		II.	Tr.	In.
	9	23		II.	Sh.	Eg.
	11	14		II.	Tr.	Eg.
	13	32		I.	Sh.	In.
	14	26		I.	Tr.	In.
	15	52		I.	Sh.	Eg.
	16	47		I.	Tr.	Eg.
17	10	43	3	I.	Ec.	Dis.
	12	14	35	III.	Ec.	Dis.
	13	57		I.	Oc.	Re.
	15	45	18	III.	Ec.	Re.
	15	54		III.	Oc.	Dis.
	19	36		III.	Oc.	Re.
18	1	35	31	II.	Ec.	Dis.
	6	19		II.	Oc.	Re.
	8	0		I.	Sh.	In.
	8	56		I.	Tr.	In.
	10	20		I.	Sh.	Eg.
	11	16		I.	Tr.	Eg.
19	5	11	30	I.	Ec.	Dis.
	8	26		I.	Oc.	Re.
	19	47		II.	Sh.	In.
	21	43		II.	Tr.	In.
	22	42		II.	Sh.	Eg.
20	0	38		II.	Tr.	Eg.
	2	29		I.	Sh.	In.
	3	26		I.	Tr.	In.
	4	49		I.	Sh.	Eg.
	5	46		I.	Tr.	Eg.
	23	40	4	I.	Ec.	Dis.
21	2	5		III.	Sh.	In.
	2	56		I.	Oc.	Re.
	5	45		III.	Sh.	Eg.
	6	1		III.	Tr.	In.
	6	27	14	IV.	Ec.	Dis.
	9	42		III.	Tr.	Eg.
	10	55	0	IV.	Ec.	Re.
21	14	52	50	II.	Ec.	Dis.
	15	27		IV.	Oc.	Dis.
	19	42		II.	Oc.	Re.
	20	13		IV.	Oc.	Re.
	20	57		I.	Sh.	In.
	21	56		I.	Tr.	In.
	23	17		I.	Sh.	Eg.
22	0	16		I.	Tr.	Eg.
	18	8	32	I.	Ec.	Dis.
	21	26		I.	Oc.	Re.
23	9	5		II.	Sh.	In.
	11	7		II.	Tr.	In.
	12	0		II.	Sh.	Eg.
	14	2		II.	Tr.	Eg.
	15	26		I.	Sh.	In.
	16	26		I.	Tr.	In.
	17	46		I.	Sh.	Eg.
	18	46		I.	Tr.	Eg.
24	12	37	5	I.	Ec.	Dis.
	15	56		I.	Oc.	Re.
	16	14	7	III.	Ec.	Dis.
	19	45	11	III.	Ec.	Re.
	20	16		III.	Oc.	Dis.
	23	59		III.	Oc.	Re.
25	4	10	3	II.	Ec.	Dis.
	9	4		II.	Oc.	Re.
	9	54		I.	Sh.	In.
	10	55		I.	Tr.	In.
	12	14		I.	Sh.	Eg.
	13	16		I.	Tr.	Eg.
26	7	5	31	I.	Ec.	Dis.
	10	26		I.	Oc.	Re.
	22	23		II.	Sh.	In.
27	0	31		II.	Tr.	In.
	1	18		II.	Sh.	Eg.
	3	26		II.	Tr.	Eg.
	4	22		I.	Sh.	In.
	5	25		I.	Tr.	In.
	6	42		I.	Sh.	Eg.
	7	45		I.	Tr.	Eg.
28	1	34	5	I.	Ec.	Dis.
	4	56		I.	Oc.	Re.
	6	4		III.	Sh.	In.
	9	44		III.	Sh.	Eg.
	10	21		III.	Tr.	In.
	14	3		III.	Tr.	Eg.
	17	27	16	II.	Ec.	Dis.
	22	27		II.	Oc.	Re.
	22	51		I.	Sh.	In.
	23	55		I.	Tr.	In.
29	1	11		I.	Sh.	Eg.
	2	15		I.	Tr.	Eg.
	15	43		IV.	Sh.	In.
	20	2	31	I.	Ec.	Dis.
	20	23		IV.	Sh.	Eg.
	23	25		I.	Oc.	Re.
30	2	2		IV.	Tr.	In.
	6	51		IV.	Tr.	Eg.
	11	41		II.	Sh.	In.
	13	54		II.	Tr.	In.
	14	36		II.	Sh.	Eg.
	16	50		II.	Tr.	Eg.
	17	19		I.*	Sh.	In.
	18	24		I.	Tr.	In.
	19	39		I.	Sh.	Eg.
	20	45		I.	Tr.	Eg.
31	14	31	5	I.	Ec.	Dis.
	17	55		I.	Oc.	Re.
	20	13	57	III.	Ec.	Dis.
	23	45	20	III.	Ec.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

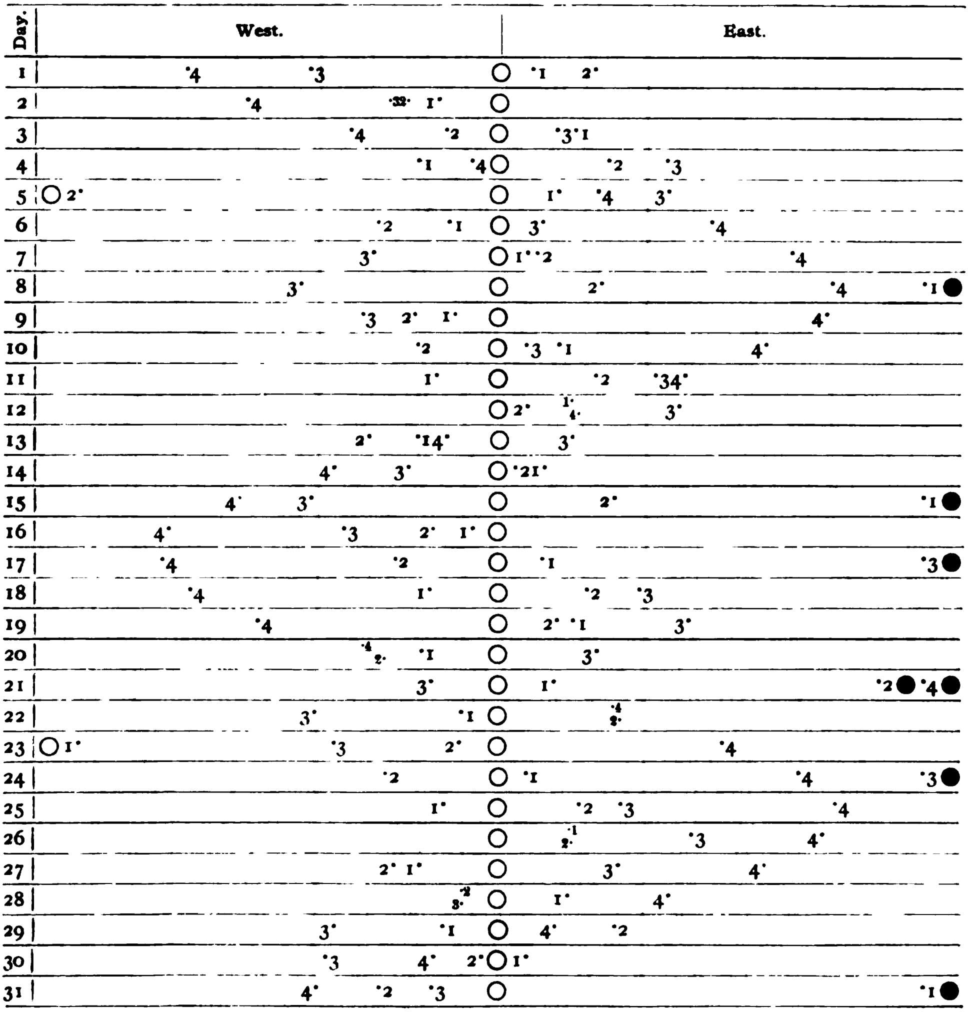
WASHINGTON MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 17h 0m for an Inverting Telescope.



WASHINGTON MEAN TIME.

APRIL.

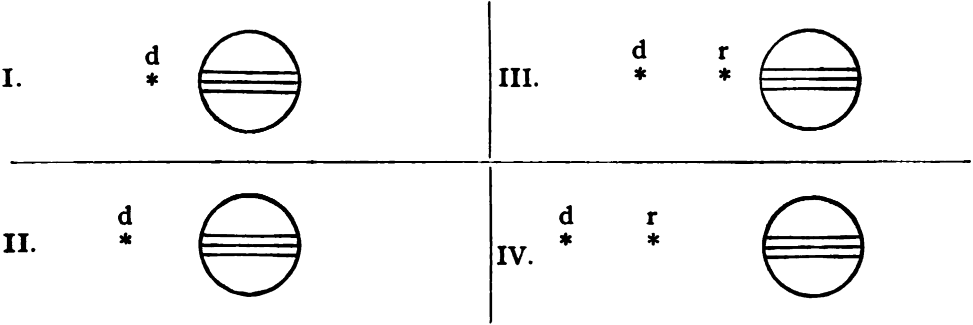
d	h	m	s			
1	0	37		III.	Oc.	Dis.
	4	19		III.	Oc.	Re.
	6	44	25	II.	Ec.	Dis.
	11	48		I.	Sh.	In.
	11	48		II.	Oc.	Re.
	12	54		I.	Tr.	In.
	14	8		I.	Sh.	Eg.
	15	14		I.	Tr.	Eg.
2	8	59	31	I.	Ec.	Dis.
	12	25		I.	Oc.	Re.
3	1	0		II.	Sh.	In.
	3	17		II.	Tr.	In.
	3	55		II.	Sh.	Eg.
	6	13		II.	Tr.	Eg.
	6	16		I.	Sh.	In.
	7	24		I.	Tr.	In.
	8	36		I.	Sh.	Eg.
	9	44		I.	Tr.	Eg.
4	3	28	5	I.	Ec.	Dis.
	6	54		I.	Oc.	Re.
	10	3		III.	Sh.	In.
	13	43		III.	Sh.	Eg.
	14	39		III.	Tr.	In.
	18	22		III.	Tr.	Eg.
	20	1	33	II.	Ec.	Dis.
5	0	44		I.	Sh.	In.
	1	10		II.	Oc.	Re.
	1	53		I.	Tr.	In.
	3	4		I.	Sh.	Eg.
	4	13		I.	Tr.	Eg.
	21	56	32	I.	Ec.	Dis.
6	1	24		I.	Oc.	Re.
	14	18		II.	Sh.	In.
	16	40		II.	Tr.	In.
	17	13		II.	Sh.	Eg.
	19	13		I.	Sh.	In.
	19	36		II.	Tr.	Eg.
	20	22		I.	Tr.	In.
	21	33		I.	Sh.	Eg.
	22	43		I.	Tr.	Eg.
7	0	31	10	IV.	Ec.	Dis.
	5	2	7	IV.	Ec.	Re.
	11	17		IV.	Oc.	Dis.
	16	8		IV.*	Oc.	Re.
	16	25	5	I.*	Ec.	Dis.
	19	53		I.	Oc.	Re.
8	0	13	12	III.	Ec.	Dis.
	3	44	53	III.	Ec.	Re.
	4	54		III.	Oc.	Dis.
	8	37		III.	Oc.	Re.
	9	18	38	II.	Ec.	Dis.
	13	41		I.	Sh.	In.
	14	31		II.	Oc.	Re.
	14	52		I.	Tr.	In.
	16	1		I.*	Sh.	Eg.
	17	12		I.	Tr.	Eg.
9	10	53	30	I.	Ec.	Dis.
	14	23		I.	Oc.	Re.
10	3	36		II.	Sh.	In.
	6	2		II.	Tr.	In.
	6	32		II.	Sh.	Eg.
	8	10		I.	Sh.	In.
	8	58		II.	Tr.	Eg.
	9	21		I.	Tr.	In.
	10	30		I.	Sh.	Eg.
	11	42		I.	Tr.	Eg.
11	5	22	3	I.	Ec.	Dis.
	8	52		I.	Oc.	Re.
	14	2		III.	Sh.	In.
	17	44		III.	Sh.	Eg.
	18	56		III.	Tr.	In.
	22	35	41	II.	Ec.	Dis.
	22	38		III.	Tr.	Eg.
12	2	38		I.	Sh.	In.
	3	50		I.	Tr.	In.
	3	52		II.	Oc.	Re.
	4	58		I.	Sh.	Eg.
	6	11		I.	Tr.	Eg.
	23	50	31	I.	Ec.	Dis.
13	3	22		I.	Oc.	Re.
	16	54		II.	Sh.	In.
	19	24		II.	Tr.	In.
	19	49		II.	Sh.	Eg.
	21	6		I.	Sh.	In.
	22	20		I.	Tr.	In.
	22	20		II.	Tr.	Eg.
	23	26		I.	Sh.	Eg.
14	0	40		I.	Tr.	Eg.
	18	19	3	I.	Ec.	Dis.
	21	51		I.	Oc.	Re.
15	4	12	19	III.	Ec.	Dis.
	7	44	17	III.	Ec.	Re.
	9	8		III.	Oc.	Dis.
	9	50		IV.	Sh.	In.
	11	52	43	II.	Ec.	Dis.
	12	51		III.	Oc.	Re.
	14	33		IV.	Sh.	Eg.
	15	34		I.*	Sh.	In.
	16	49		I.*	Tr.	In.
	17	13		II.	Oc.	Re.
	17	55		I.	Sh.	Eg.
	19	9		I.	Tr.	Eg.
	21	42		IV.	Tr.	In.
16	2	34		IV.	Tr.	Eg.
	12	47	28	I.	Ec.	Dis.
	16	20		I.*	Oc.	Re.
17	6	13		II.	Sh.	In.
	8	46		II.	Tr.	In.
	9	8		II.	Sh.	Eg.
	10	3		I.	Sh.	In.
	11	18		I.	Tr.	In.
	11	42		II.	Tr.	Eg.
	12	23		I.	Sh.	Eg.
	13	38		I.	Tr.	Eg.
18	7	16	1	I.	Ec.	Dis.
	10	50		I.	Oc.	Re.
	18	2		III.	Sh.	In.
	21	43		III.	Sh.	Eg.
	23	9		III.	Tr.	In.
19	1	9	42	II.	Ec.	Dis.
	2	51		III.	Tr.	Eg.
	4	31		I.	Sh.	In.
	5	47		I.	Tr.	In.
	6	33		II.	Oc.	Re.
	6	51		I.	Sh.	Eg.
	8	8		I.	Tr.	Eg.
20	1	44	28	I.	Ec.	Dis.
	5	19		I.	Oc.	Re.
	19	31		II.	Sh.	In.
	22	7		II.	Tr.	In.
	22	26		II.	Sh.	Eg.
	23	0		I.	Sh.	In.
21	0	16		I.	Tr.	In.
	1	3		II.	Tr.	Eg.
	1	20		I.	Sh.	Eg.
	2	37		I.	Tr.	Eg.
	20	13	1	I.	Ec.	Dis.
	23	48		I.	Oc.	Re.
22	8	11	32	III.	Ec.	Dis.
	11	43	45	III.	Ec.	Re.
	13	20		III.	Oc.	Dis.
	14	26	41	II.*	Ec.	Dis.
	17	2		III.	Oc.	Re.
	17	28		I.	Sh.	In.
	18	45		I.	Tr.	In.
	19	48		I.	Sh.	Eg.
	19	52		II.	Oc.	Re.
	21	6		I.	Tr.	Eg.
23	14	41	26	I.*	Ec.	Dis.
	18	18		I.	Oc.	Re.
	18	35	48	IV.	Ec.	Dis.
	23	9	35	IV.	Ec.	Re.
24	6	34		IV.	Oc.	Dis.
	8	50		II.	Sh.	In.
	11	28		IV.	Oc.	Re.
	11	29		II.	Tr.	In.
	11	45		II.	Sh.	Eg.
	11	56		I.	Sh.	In.
	13	14		I.	Tr.	In.
	14	16		I.	Sh.	Eg.
	14	25		II.*	Tr.	Eg.
	15	35		I.*	Tr.	Eg.
25	9	9	59	I.	Ec.	Dis.
	12	47		I.	Oc.	Re.
	22	1		III.	Sh.	In.
26	1	43		III.	Sh.	Eg.
	3	18		III.	Tr.	In.
	3	43	37	II.	Ec.	Dis.
	6	24		I.	Sh.	In.
	7	2		III.	Tr.	Eg.
	7	43		I.	Tr.	In.
	8	45		I.	Sh.	Eg.
	9	12		II.	Oc.	Re.
	10	4		I.	Tr.	Eg.
27	3	38	26	I.	Ec.	Dis.
	7	16		I.	Oc.	Re.
	22	7		II.	Sh.	In.
28	0	49		II.	Tr.	In.
	0	53		I.	Sh.	In.
	1	3		II.	Sh.	Eg.
	2	12		I.	Tr.	In.
	3	13		I.	Sh.	Eg.
	3	45		II.	Tr.	Eg.
	4	32		I.	Tr.	Eg.
	22	6	58	I.	Ec.	Dis.
29	1	45		I.	Oc.	Re.
	12	10	52	III.	Ec.	Dis.
	15	43	20	III.*	Ec.	Re.
	17	0	33	II.	Ec.	Dis.
	17	28		III.	Oc.	Dis.
	19	21		I.	Sh.	In.
	20	41		I.	Tr.	In.
	21	11		III.	Oc.	Re.
	21	41		I.	Sh.	Eg.
	22	30		II.	Oc.	Re.
	23	1		I.	Tr.	Eg.
30	16	35	23	I.	Ec.	Dis.
	20	14		I.	Oc.	Re.

Note.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 16ʰ 0ᵐ for an Inverting Telescope.

Day.	West.	East.
1	4· 1·	·2 ·3
2	4·	·1 2· ·3
3	·4 2· 1·	3·
4	○ 3· ·4 ·2	·1
5	·4 3· ·1	·2
6	·3 ·4	2· 1·
7	·2 ·3 ·1	·4 ●
8	○ 1·	·2 ·3 ·4
9		·1 2· ·3 ·4
10	2·1·	3· ·4
11	·2	3· ·1 ·4
12	3· ·1	·2 4·
13	·3	2· 1· 4·
14	·3 2· ·1	4·
15		1· ·3 4· ·2 ●
16	4·	2· ·3 ·1 ●
17	4· 2· 1·	3·
18	4· ·2	·1 3·
19	4· 3· 1·	·2
20	·4 3·	2·1·
21	·4 ·3 2· ·1	
22	·4	1· ·2 ● ·3 ●
23	·4	2· ·3 ·1 ●
24	1· 2·	·4 3·
25	·2	·1 3· ·4
26	3·1·	·2 ·4
27	3·	·1 2· ·4
28	·3 2· ·1	4·
29	·2·3	1· 4·
30	·1	·2·3 4·

WASHINGTON MEAN TIME.

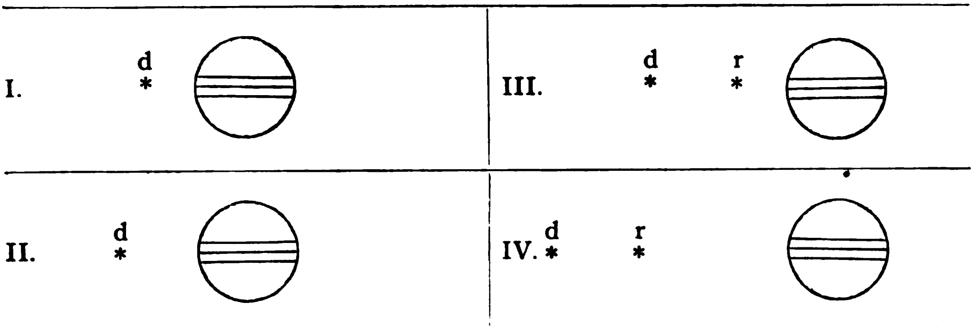
MAY.

d	h	m	s			
1	11	26		II.	Sh.	In.
	13	50		I.	Sh.	In.
	14	10		II.*	Tr.	In.
	14	22		II.*	Sh.	Eg.
	15	9		I.*	Tr.	In.
	16	10		I.*	Sh.	Eg.
	17	6		II.	Tr.	Eg.
	17	30		I.	Tr.	Eg.
2	3	56		IV.	Sh.	In.
	8	42		IV.	Sh.	Eg.
	11	3	56	I.	Ec.	Dis.
	14	42		I.*	Oc.	Re.
	16	42		IV.	Tr.	In.
	21	37		IV.	Tr.	Eg.
3	2	0		III.	Sh.	In.
	5	42		III.	Sh.	Eg.
	6	17	27	II.	Ec.	Dis.
	7	25		III.	Tr.	In.
	8	18		I.	Sh.	In.
	9	38		I.	Tr.	In.
	10	38		I.	Sh.	Eg.
	11	8		III.	Tr.	Eg.
	11	49		II.	Oc.	Re.
	11	58		I.	Tr.	Eg.
4	5	32	23	I.	Ec.	Dis.
	9	11		I.	Oc.	Re.
5	0	44		II.	Sh.	In.
	2	46		I.	Sh.	In.
	3	29		II.	Tr.	In.
	3	40		II.	Sh.	Eg.
	4	7		I.	Tr.	In.
	5	6		I.	Sh.	Eg.
	6	25		II.	Tr.	Eg.
	6	27		I.	Tr.	Eg.
6	0	0	56	I.	Ec.	Dis.
	3	40		I.	Oc.	Re.
	16	10	52	III.*	Ec.	Dis.
	19	34	21	II.	Ec.	Dis.
	19	43	33	III.	Ec.	Re.
	21	14		I.	Sh.	In.
	21	33		III.	Oc.	Dis.
	22	35		I.	Tr.	In.
	23	35		I.	Sh.	Eg.
7	0	56		I.	Tr.	Eg.
	1	7		II.	Oc.	Re.
	1	16		III.	Oc.	Re.
	18	29	20	I.	Ec.	Dis.
	22	9		I.	Oc.	Re.
8	14	3		II.*	Sh.	In.
	15	43		I.*	Sh.	In.
	16	49		II.	Tr.	In.
	16	59		II.	Sh.	Eg.
	17	4		I.	Tr.	In.
	18	3		I.	Sh.	Eg.
	19	24		I.	Tr.	Eg.
	19	45		II.	Tr.	Eg.
9	12	57	54	I.	Ec.	Dis.
	16	37		I.	Oc.	Re.
10	5	59		III.	Sh.	In.
	8	51	14	II.	Ec.	Dis.
	9	41		III.	Sh.	Eg.
	10	11		I.	Sh.	In.
	11	27		III.	Tr.	In.
	11	32		I.	Tr.	In.
	12	31		I.	Sh.	Eg.
	12	40	9	IV.	Ec.	Dis.
10	13	53		I.*	Tr.	Eg.
	14	24		II.*	Oc.	Re.
	15	10		III.*	Tr.	Eg.
	17	16	23	IV.	Ec.	Re.
11	1	8		IV.	Oc.	Dis.
	6	4		IV.	Oc.	Re.
	7	26	21	I.	Ec.	Dis.
	11	6		I.	Oc.	Re.
12	3	21		II.	Sh.	In.
	4	40		I.	Sh.	In.
	6	1		I.	Tr.	In.
	6	7		II.	Tr.	In.
	6	17		II.	Sh.	Eg.
	7	0		I.	Sh.	Eg.
	8	21		I.	Tr.	Eg.
	9	3		II.	Tr.	Eg.
13	1	54	54	I.	Ec.	Dis.
	5	34		I.	Oc.	Re.
	20	10	28	III.	Ec.	Dis.
	22	8	6	II.	Ec.	Dis.
	23	8		I.	Sh.	In.
	23	43	20	III.	Ec.	Re.
14	0	29		I.	Tr.	In.
	1	28		I.	Sh.	Eg.
	1	34		III.	Oc.	Dis.
	2	49		I.	Tr.	Eg.
	3	41		II.	Oc.	Re.
	5	17		III.	Oc.	Re.
	20	23	19	I.	Ec.	Dis.
15	0	3		I.	Oc.	Re.
	16	40		II.	Sh.	In.
	17	36		I.	Sh.	In.
	18	57		I.	Tr.	In.
	19	26		II.	Tr.	In.
	19	36		II.	Sh.	Eg.
	19	56		I.	Sh.	Eg.
	21	18		I.	Tr.	Eg.
	22	22		II.	Tr.	Eg.
16	14	51	52	I.*	Ec.	Dis.
	18	31		I.	Oc.	Re.
17	9	58		III.	Sh.	In.
	11	24	59	II.	Ec.	Dis.
	12	4		I.	Sh.	In.
	13	26		I.*	Tr.	In.
	13	40		III.*	Sh.	Eg.
	14	25		I.*	Sh.	Eg.
	15	25		III.*	Tr.	In.
	15	46		I.*	Tr.	Eg.
	16	57		II.	Oc.	Re.
	19	8		III.	Tr.	Eg.
18	9	20	19	I.	Ec.	Dis.
	13	0		I.	Oc.	Re.
	22	4		IV.	Sh.	In.
19	2	53		IV.	Sh.	Eg.
	5	58		II.	Sh.	In.
	6	33		I.	Sh.	In.
	7	54		I.	Tr.	In.
	8	43		II.	Tr.	In.
	8	53		I.	Sh.	Eg.
	8	54		II.	Sh.	Eg.
	10	14		I.	Tr.	Eg.
	10	56		IV.	Tr.	In.
	11	39		II.	Tr.	Eg.
	15	52		IV.*	Tr.	Eg.
20	3	48	52	I.	Ec.	Dis.
	7	28		I.	Oc.	Re.
21	0	10	22	III.	Ec.	
	0	41	50	II.	Ec.	
	1	1		I.	Sh.	
	2	22		I.	Tr.	
	3	21		I.	Sh.	
	3	43	24	III.	Ec.	
	4	42		I.	Tr.	
	5	32		III.	Oc.	
	6	13		II.	Oc.	
	9	14		III.	Oc.	
	22	17	18	I.	Ec.	
22	1	56		I.	Oc.	
	19	17		II.	Sh.	
	19	30		I.	Sh.	
	20	50		I.	Tr.	
	21	50		I.	Sh.	
	22	1		II.	Tr.	
	22	12		II.	Sh.	
	23	10		I.	Tr.	
23	0	57		II.	Tr.	
	16	45	51	I.	Ec.	
	20	24		I.	Oc.	
24	13	57		III.*	Sh.	
	13	58		I.*	Sh.	
	13	58	43	II.*	Ec.	
	15	18		I.*	Tr.	
	16	18		I.	Sh.	
	17	38		I.	Tr.	
	17	39		III.	Sh.	
	19	20		III.	Tr.	
	19	29		II.	Oc.	
	23	2		III.	Tr.	
25	11	14	19	I.	Ec.	
	14	52		I.*	Oc.	
26	8	26		I.	Sh.	
	8	35		II.	Sh.	
	9	46		I.	Tr.	
	10	46		I.	Sh.	
	11	17		II.	Tr.	
	11	30		II.	Sh.	
	12	6		I.	Tr.	
	14	13		II.*	Tr.	
27	5	42	53	I.	Ec.	
	6	44	55	IV.	Ec.	
	9	20		I.	Oc.	
	11	23	14	IV.	Ec.	
	18	52		IV.	Oc.	
	23	49		IV.	Oc.	
28	2	55		I.	Sh.	
	3	15	35	II.	Ec.	
	4	9	44	III.	Ec.	
	4	13		I.	Tr.	
	5	15		I.	Sh.	
	6	34		I.	Tr.	
	7	42	55	III.	Ec.	
	8	44		II.	Oc.	
	9	24		III.	Oc.	
	13	6		III.*	Oc.	
29	0	11	18	I.	Ec.	
	3	48		I.	Oc.	
	21	23		I.	Sh.	
	21	54		II.	Sh.	
	22	41		I.	Tr.	
	23	43		I.	Sh.	
30	0	33		II.	Tr.	
	0	49		II.	Sh.	
	1	2		I.	Tr.	
	3	30		II.	Tr.	
	18	39	52	I.	Ec.	
	22	16		I.	Oc.	
31	15	51		I.*	Sh.	
	16	32	29	II.	Ec.	
	17	9		I.	Tr.	
	17	56		III.	Sh.	
	18	11		I.	Sh.	
	19	29		I.	Tr.	
	21	39		III.	Sh.	
	21	58		II.	Oc.	
	23	10		III.	Tr.	

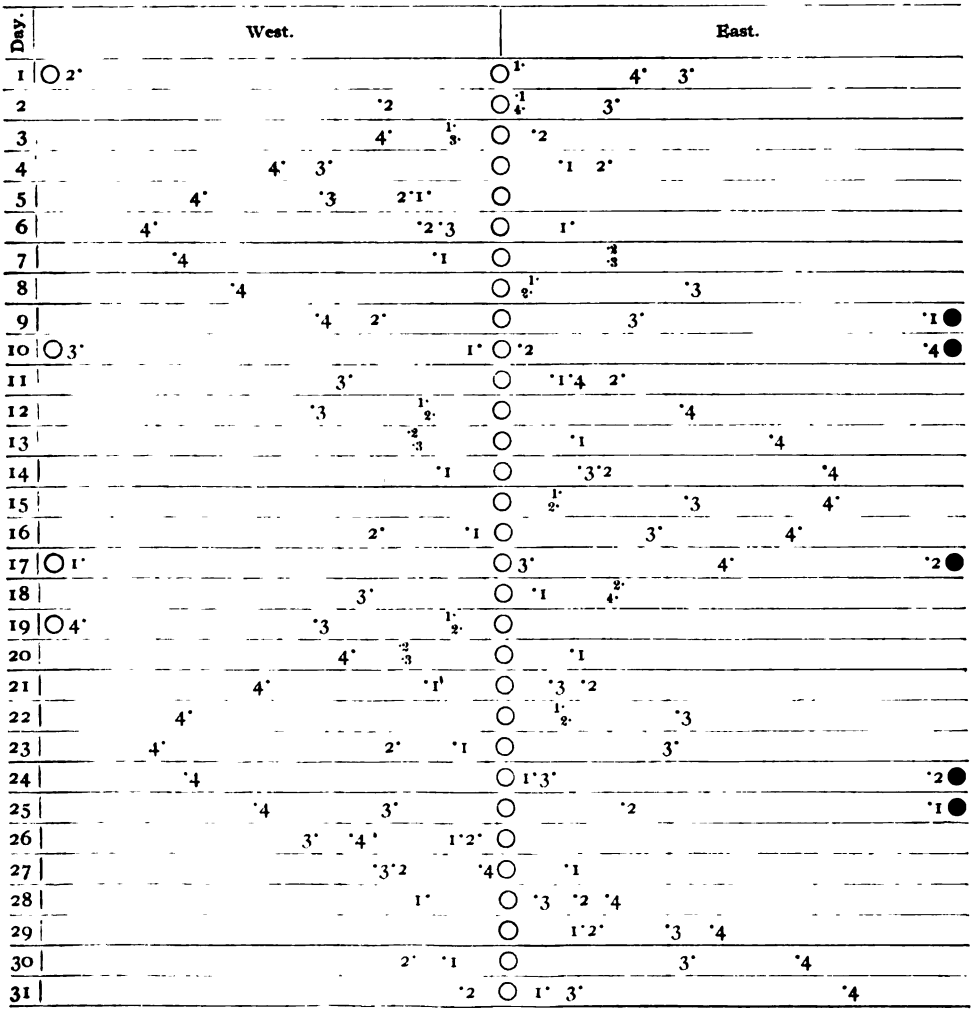
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 14^h 45^m for an Inverting Telescope.



WASHINGTON MEAN TIME.

JUNE.

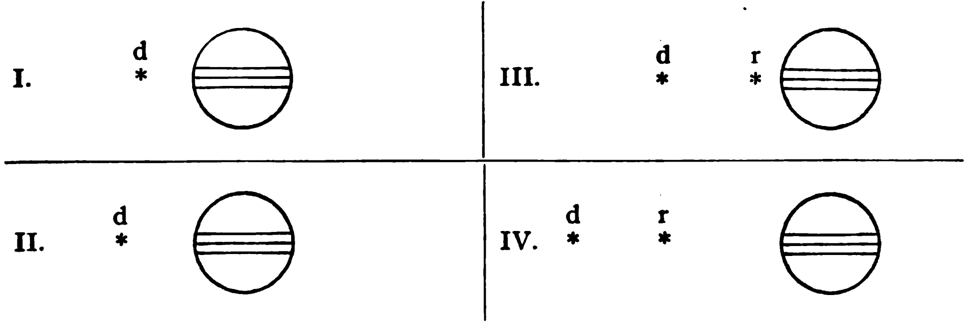
d	h	m	s			
1	2	52		III.	Tr.	Eg.
	13	8	20	I.*	Ec.	Dis.
	16	44		I.	Oc.	Re.
2	10	20		I.	Sh.	In.
	11	12		II.	Sh.	In.
	11	36		I.	Tr.	In.
	12	40		I.*	Sh.	Eg.
	13	48		II.*	Tr.	In.
	13	57		I.*	Tr.	Eg.
	14	8		II.*	Sh.	Eg.
	16	45		II.	Tr.	Eg.
3	7	36	54	I.	Ec.	Dis.
	11	12		I.	Oc.	Re.
4	4	48		I.	Sh.	In.
	5	49	22	II.	Ec.	Dis.
	6	4		I.	Tr.	In.
	7	8		I.	Sh.	Eg.
	8	9	3	III.	Ec.	Dis.
	8	24		I.	Tr.	Eg.
	11	12		II.*	Oc.	Re.
	11	42	21	III.	Ec.	Re.
	13	12		III.*	Oc.	Dis.
	16	12		IV.	Sh.	In.
	16	54		III.	Oc.	Re.
	21	2		IV.	Sh.	Eg.
5	2	5	21	I.	Ec.	Dis.
	4	14		IV.	Tr.	In.
	5	39		I.	Oc.	Re.
	9	10		IV.	Tr.	Eg.
	23	16		I.	Sh.	In.
6	0	30		II.	Sh.	In.
	0	32		I.	Tr.	In.
	1	36		I.	Sh.	Eg.
	2	52		I.	Tr.	Eg.
	3	4		II.	Tr.	In.
	3	26		II.	Sh.	Eg.
	6	0		II.	Tr.	Eg.
	20	33	55	I.	Ec.	Dis.
7	0	7		I.	Oc.	Re.
	17	45		I.	Sh.	In.
	18	59		I.	Tr.	In.
	19	6	18	II.	Ec.	Dis.
	20	5		I.	Sh.	Eg.
	21	19		I.	Tr.	Eg.
	21	56		III.	Sh.	In.
8	0	25		II.	Oc.	Re.
	1	38		III.	Sh.	Eg.
	2	56		III.	Tr.	In.
	6	38		III.	Tr.	Eg.
	15	2	24	I.*	Ec.	Dis.
	18	34		I.	Oc.	Re.
9	12	13		I.*	Sh.	In.
	13	26		I.*	Tr.	In.
	13	48		II.*	Sh.	In.
	14	33		I.*	Sh.	Eg.
	15	46		I.*	Tr.	Eg.
	16	18		II.	Tr.	In.
	16	44		II.	Sh.	Eg.
	19	14		II.	Tr.	Eg.
10	9	30	59	I.	Ec.	Dis.
	13	2		I.	Oc.	Re.
11	6	41		I.	Sh.	In.
	7	54		I.	Tr.	In.
	8	23	13	II.	Ec.	Dis.
	9	2		I.	Sh.	Eg.
	10	14		I.	Tr.	Eg.
11	12	8	33	III.*	Ec.	Dis.
	13	38		II.*	Oc.	Re.
	15	41	56	III.*	Ec.	Re.
	16	55		III.	Oc.	Dis.
	20	37		III.	Oc.	Re.
12	3	59	26	I.	Ec.	Dis.
	7	29		I.	Oc.	Re.
13	0	50	45	IV.	Ec.	Dis.
	1	10		I.	Sh.	In.
	2	21		I.	Tr.	In.
	3	8		II.	Sh.	In.
	3	30		I.	Sh.	Eg.
	4	41		I.	Tr.	Eg.
	5	30	48	IV.	Ec.	Re.
	5	32		II.	Tr.	In.
	6	4		II.	Sh.	Eg.
	8	28		II.	Tr.	Eg.
	11	42		IV.*	Oc.	Dis.
	16	38		IV.	Oc.	Re.
	22	28	0	I.	Ec.	Dis.
14	1	57		I.	Oc.	Re.
	19	38		I.	Sh.	In.
	20	48		I.	Tr.	In.
	21	40	11	II.	Ec.	Dis.
	21	58		I.	Sh.	Eg.
	23	8		I.	Tr.	Eg.
15	1	56		III.	Sh.	In.
	2	50		II.	Oc.	Re.
	5	38		III.	Sh.	Eg.
	6	37		III.	Tr.	In.
	10	19		III.	Tr.	Eg.
	16	56	30	I.	Ec.	Dis.
	20	24		I.	Oc.	Re.
16	14	6		I.*	Sh.	In.
	15	15		I.*	Tr.	In.
	16	26		II.	Sh.	In.
	16	27		I.	Sh.	Eg.
	17	35		I.	Tr.	Eg.
	18	45		II.	Tr.	In.
	19	22		II.	Sh.	Eg.
	21	41		II.	Tr.	Eg.
17	11	25	6	I.*	Ec.	Dis.
	14	51		I.*	Oc.	Re.
18	8	35		I.	Sh.	In.
	9	42		I.	Tr.	In.
	10	55		I.	Sh.	Eg.
	10	57	9	II.*	Ec.	Dis.
	12	2		I.*	Tr.	Eg.
	16	2		II.	Oc.	Re.
	16	8	14	III.	Ec.	Dis.
	19	41	42	III.	Ec.	Re.
	20	34		III.	Oc.	Dis.
19	0	16		III.	Oc.	Re.
	5	53	34	I.	Ec.	Dis.
	9	18		I.	Oc.	Re.
20	3	3		I.	Sh.	In.
	4	9		I.	Tr.	In.
	5	24		I.	Sh.	Eg.
	5	44		II.	Sh.	In.
	6	29		I.	Tr.	Eg.
	7	58		II.	Tr.	In.
	8	40		II.	Sh.	Eg.
	10	54		II.*	Tr.	Eg.
21	0	22	9	I.	Ec.	Dis.
	3	45		I.	Oc.	Re.
	10	20		IV.	Sh.	In.
21	15	12		IV.*	Sh.	E
	20	34		IV.	Tr.	I
	21	32		I.	Sh.	I
	22	36		I.	Tr.	I
	23	52		I.	Sh.	E
22	0	14	11	II.	Ec.	D
	0	56		I.	Tr.	E
	1	29		IV.	Tr.	E
	5	13		II.	Oc.	R
	5	55		III.	Sh.	I
	9	38		III.	Sh.	E
	10	13		III.	Tr.	I
	13	55		III.*	Tr.	E
	18	50	40	I.	Ec.	D
	22	12		I.	Oc.	R
23	16	0		I.*	Sh.	I
	17	3		I.	Tr.	I
	18	20		I.	Sh.	E
	19	2		II.	Sh.	I
	19	23		I.	Tr.	E
	21	9		II.	Tr.	I
	21	58		II.	Sh.	E
24	0	6		II.	Tr.	E
	13	19	16	I.*	Ec.	D
	16	39		I.	Oc.	R
25	10	28		I.	Sh.	I
	11	29		I.*	Tr.	I
	12	49		I.*	Sh.	E
	13	31	12	II.*	Ec.	D
	13	50		I.*	Tr.	E
	18	24		II.	Oc.	R
	20	8	38	III.	Ec.	D
	23	42	9	III	Ec.	R
26	0	9		III.	Oc.	D
	3	50		III.	Oc.	R
	7	47	46	I.	Ec.	D
	11	6		I.*	Oc.	R
27	4	57		I.	Sh.	In
	5	56		I.	Tr.	In
	7	17		I.	Sh.	E
	8	16		I.	Tr.	E
	8	21		II.	Sh.	In
	10	21		II.*	Tr.	In
	11	17		II.*	Sh.	E
	13	18		II.*	Tr.	E
28	2	16	22	I.	Ec.	D
	5	33		I.	Oc.	R
	23	25		I.	Sh.	In
29	0	23		I.	Tr.	In
	1	46		I.	Sh.	E
	2	43		I.	Tr.	E
	2	48	18	II.	Ec.	Di
	7	34		II.	Oc.	Re
	9	54		III.	Sh.	In
	13	37		III.*	Sh.	Eg
	13	44		III.*	Tr.	In.
	17	26		III.	Tr.	Eg
	18	56	41	IV.	Ec.	Dis
	20	44	54	I.	Ec.	Dis
	23	38	6	IV.	Ec.	Re.
30	0	0		I.	Oc.	Re.
	3	33		IV.	Oc.	Dis
	8	29		IV.	Oc.	Re.
	17	54		I.	Sh.	In.
	18	49		I.	Tr.	In.
	20	14		I.	Sh.	Eg.
	21	9		I.	Tr.	Eg.
	21	39		II.	Sh.	In.
	23	32		II.	Tr.	In.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

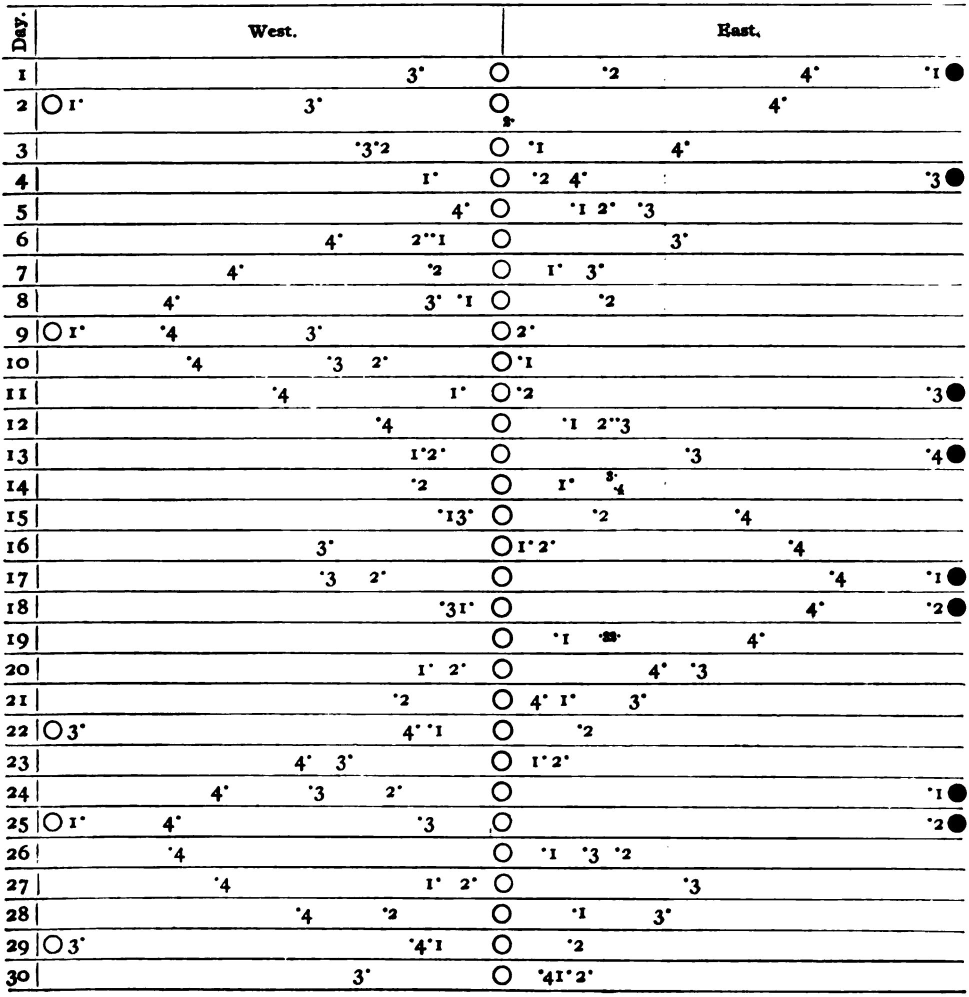
WASHINGTON MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13h 45m for an Inverting Telescope.



WASHINGTON MEAN TIME.

JULY.

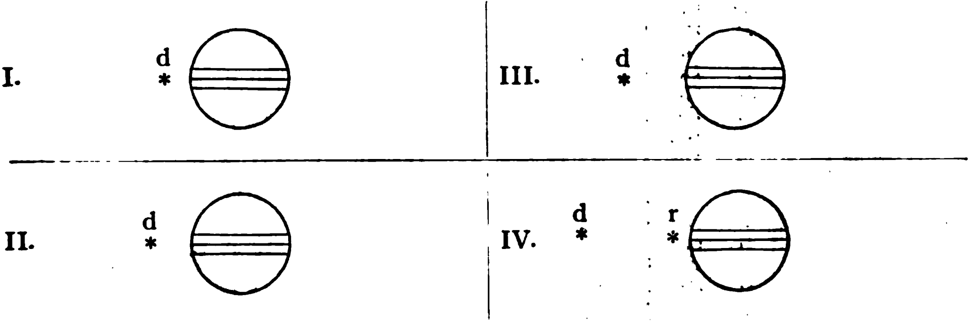
d	h	m	s			
1	0	35		II.	Sh.	Eg.
	2	28		II.	Tr.	Eg.
	15	13	31	I.*	Ec.	Dis.
	18	26		I.	Oc.	Re.
2	12	22		I.*	Sh.	In.
	13	16		I.*	Tr.	In.
	14	42		I.*	Sh.	Eg.
	15	36		I.*	Tr.	Eg.
	16	5	25	II.*	Ec.	Dis.
	20	44		II.	Oc.	Re.
3	0	8	40	III.	Ec.	Dis.
	7	20		III.	Oc.	Re.
	9	42	2	I.	Ec.	Dis.
	12	53		I.*	Oc.	Re.
4	6	50		I.	Sh.	In.
	7	42		I.	Tr.	In.
	9	11		I.	Sh.	Eg.
	10	2		I.	Tr.	Eg.
	10	58		II.*	Sh.	In.
	12	42		II.*	Tr.	In.
	13	54		II.*	Sh.	Eg.
	15	39		II.*	Tr.	Eg.
5	4	10	39	I.	Ec.	Dis.
	7	20		I.	Oc.	Re.
6	1	19		I.	Sh.	In.
	2	8		I.	Tr.	In.
	3	39		I.	Sh.	Eg.
	4	29		I.	Tr.	Eg.
	5	22	35	II.	Ec.	Dis.
	9	53		II.*	Oc.	Re.
	13	53		III.*	Sh.	In.
	17	12		III.	Tr.	In.
	17	36		III.	Sh.	Eg.
	20	53		III.	Tr.	Eg.
	22	39	12	I.	Ec.	Dis.
7	1	46		I.	Oc.	Re.
	19	47		I.	Sh.	In.
	20	35		I.	Tr.	In.
	22	8		I.	Sh.	Eg.
	22	55		I.	Tr.	Eg.
8	0	16		II.	Sh.	In.
	1	52		II.	Tr.	In.
	3	12		II.	Sh.	Eg.
	4	29		IV.	Sh.	In.
	4	48		II.	Tr.	Eg.
	9	23		IV.	Sh.	Eg.
	11	56		IV.*	Tr.	In.
	16	52		IV.	Tr.	Eg.
	17	7	50	I.	Ec.	Dis.
	20	12		I.	Oc.	Re.
9	14	16		I.*	Sh.	In.
	15	1		I.*	Tr.	In.
	16	36		I.	Sh.	Eg.
	17	21		I.	Tr.	Eg.
	18	39	48	II.	Ec.	Dis.
	23	2		II.	Oc.	Re.
10	4	9	2	III.	Ec.	Dis.
	10	47		III.*	Oc.	Re.
	11	36	22	I.*	Ec.	Dis.
	14	39		I.*	Oc.	Re.
11	8	44		I.	Sh.	In.
	9	27		I.	Tr.	In.
	11	5		I.*	Sh.	Eg.
	11	48		I.*	Tr.	Eg.
	13	35		II.*	Sh.	In.
11	15	2		II.*	Tr.	In.
	16	31		II.	Sh.	Eg.
	17	58		II.	Tr.	Eg.
12	6	5	1	I.	Ec.	Dis.
	9	5		I.	Oc.	Re.
13	3	13		I.	Sh.	In.
	3	54		I.	Tr.	In.
	5	33		I.	Sh.	Eg.
	6	14		I.	Tr.	Eg.
	7	57	3	II.	Ec.	Dis.
	12	10		II.*	Oc.	Re.
	17	53		III.	Sh.	In.
	20	35		III.	Tr.	In.
	21	36		III.	Sh.	Eg.
14	0	17		III.	Tr.	Eg.
	0	33	34	I.	Ec.	Dis.
	3	31		I.	Oc.	Re.
	21	41		I.	Sh.	In.
	22	20		I.	Tr.	In.
15	0	2		I.	Sh.	Eg.
	0	40		I.	Tr.	Eg.
	2	53		II.	Sh.	In.
	4	10		II.	Tr.	In.
	5	49		II.	Sh.	Eg.
	7	7		II.	Tr.	Eg.
	19	2	15	I.	Ec.	Dis.
	21	58		I.	Oc.	Re.
16	13	3	33	IV.*	Ec.	Dis.
	16	10		I.*	Sh.	In.
	16	46		I.	Tr.	In.
	17	45	58	IV.	Ec.	Re.
	18	30		I.	Sh.	Eg.
	18	33		IV.	Oc.	Dis.
	19	6		I.	Tr.	Eg.
	21	14	22	II.	Ec.	Dis.
	23	28		IV.	Oc.	Re.
17	1	18		II.	Oc.	Re.
	8	8	59	III.	Ec.	Dis.
	13	30	48	I.*	Ec.	Dis.
	14	9		III.*	Oc.	Re.
	16	24		I.	Oc.	Re.
18	10	38		I.*	Sh.	In.
	11	12		I.*	Tr.	In.
	12	59		I.*	Sh.	Eg.
	13	32		I.*	Tr.	Eg.
	16	12		II.	Sh.	In.
	17	19		II.	Tr.	In.
	19	8		II.	Sh.	Eg.
	20	16		II.	Tr.	Eg.
19	7	59	27	I.	Ec.	Dis.
	10	50		I.*	Oc.	Re.
20	5	7		I.	Sh.	In.
	5	38		I.	Tr.	In.
	7	27		I.	Sh.	Eg.
	7	58		I.	Tr.	Eg.
	10	31	44	II.*	Ec.	Dis.
	14	26		II.*	Oc.	Re.
	21	54		III.	Sh.	In.
	23	56		III.	Tr.	In.
21	1	37		III.	Sh.	Eg.
	2	28	3	I.	Ec.	Dis.
	3	38		III.	Tr.	Eg.
	5	16		I.	Oc.	Re.
	23	35		I.	Sh.	In.
22	0	4		I.	Tr.	In.
22	1	56		I.	Sh.	Eg
	2	24		I.	Tr.	Eg
	5	30		II.	Sh.	In
	6	27		II.	Tr.	In
	8	26		II.*	Sh.	Eg
	9	24		II.*	Tr.	Eg
	20	56	44	I.	Ec.	Di
	23	42		I.	Oc.	Re
23	18	4		I.	Sh.	In
	18	30		I.	Tr.	In
	20	24		I.	Sh.	Eg
	20	50		I.	Tr.	Eg
	23	49	10	II.	Ec.	Di
24	3	34		II.	Oc.	Re
	12	8	56	III.*	Ec.	Di
	15	25	19	I.*	Ec.	Di
	17	28		III.	Oc.	Re
	18	8		I.	Oc.	Re
	22	39		IV.	Sh.	In.
25	2	31		IV.	Tr.	In.
	3	34		IV.	Sh.	Eg
	7	27		IV.	Tr.	Eg
	12	32		I.*	Sh.	In.
	12	56		I.*	Tr.	In.
	14	53		I.*	Sh.	Eg
	15	16		I.*	Tr.	Eg
	18	49		II.	Sh.	In.
	19	36		II.	Tr.	In.
	21	45		II.	Sh.	Eg
	22	32		II.	Tr.	Eg
26	9	53	59	I.*	Ec.	Di
	12	34		I.*	Oc.	Re
27	7	1		I.	Sh.	In.
	7	22		I.	Tr.	In.
	9	21		I.*	Sh.	Eg.
	9	42		I.*	Tr.	Eg.
	13	6	38	II.*	Ec.	Di
	16	41		II.	Oc.	Re.
28	1	54		III.	Sh.	In.
	3	14		III.	Tr.	In.
	4	22	36	I.	Ec.	Dis
	5	37		III.	Sh.	Eg.
	6	56		III.	Tr.	Eg.
	7	0		I.	Oc.	Re.
29	1	29		I.	Sh.	In.
	1	48		I.	Tr.	In.
	3	50		I.	Sh.	Eg.
	4	8		I.	Tr.	Eg.
	8	7		II.*	Sh.	In.
	8	43		II.*	Tr.	In.
	11	3		II.*	Sh.	Eg.
	11	40		II.*	Tr.	Eg.
	22	51	19	I.	Ec.	Dis.
30	1	26		I.	Oc.	Re.
	19	58		I.	Sh.	In.
	20	14		I.	Tr.	In.
	22	18		I.	Sh.	Eg.
	22	34		I.	Tr.	Eg.
31	2	24	12	II.	Ec.	Dis.
	5	48		II.	Oc.	Re.
	16	9	10	III.*	Ec.	Dis.
	17	19	55	I.	Ec.	Dis.
	19	52		I.	Oc.	Re.
	20	45		III.	Oc.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

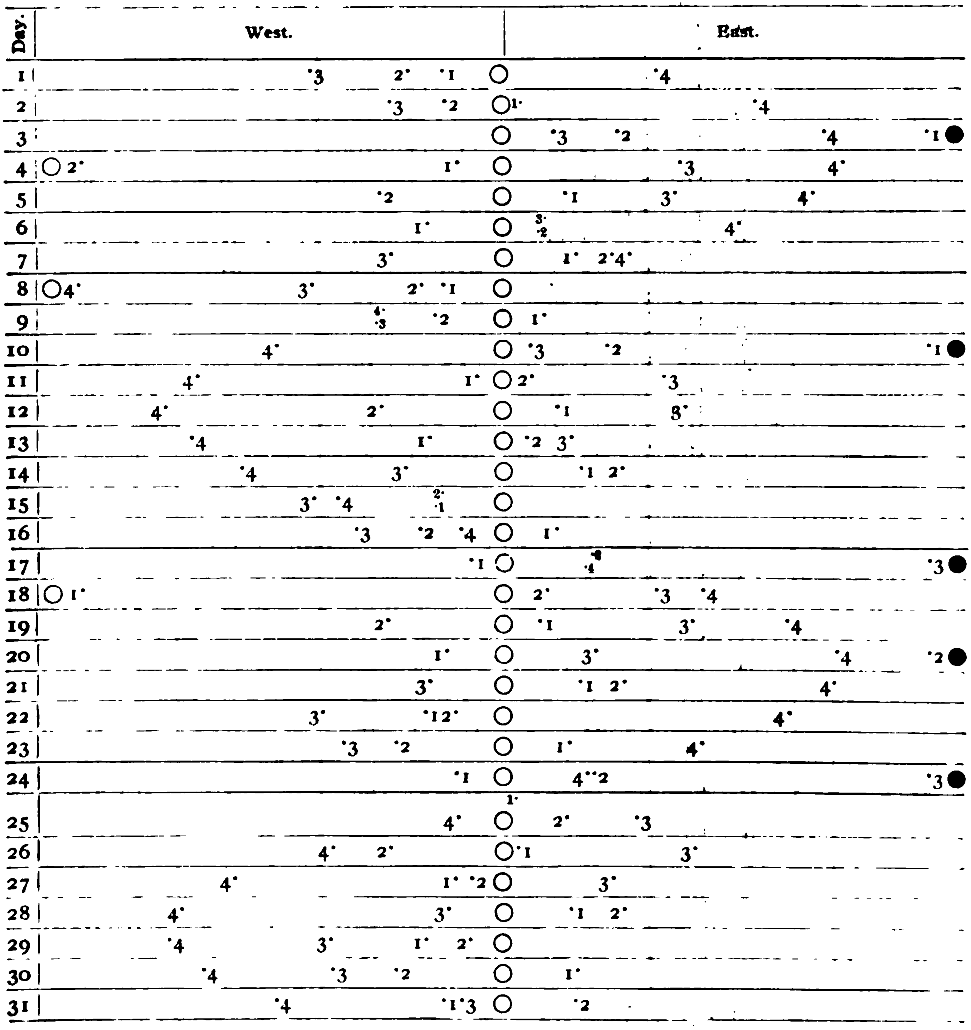
WASHINGTON MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at $12^h\ 45^m$ for an Inverting Telescope.



WASHINGTON MEAN TIME.

AUGUST.

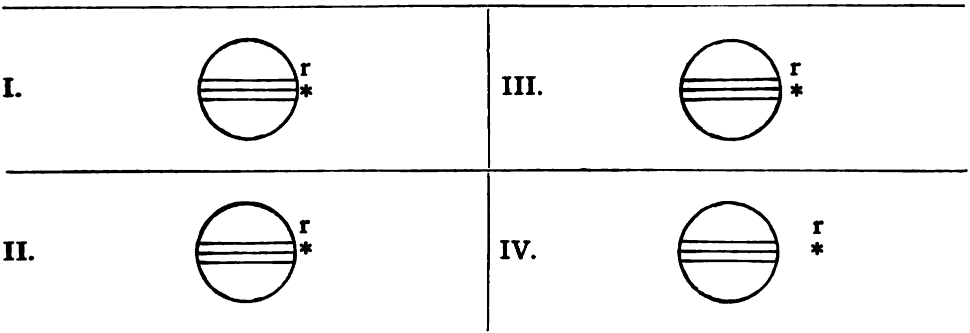
d	h	m	s			
1	14	26		I.*	Sh.	In.
	14	40		I.*	Tr.	In.
	16	47		I.	Sh.	Eg.
	17	0		I.	Tr.	Eg.
	21	26		II.	Sh.	In.
	21	51		II.	Tr.	In.
2	0	22		II.	Sh.	Eg.
	0	48		II.	Tr.	Eg.
	7	11	55	IV.	Ec.	Dis.
	11	48	38	I.*	Ec.	Dis.
	13	52		IV.*	Oc.	Re.
	14	18		I.*	Oc.	Re.
3	8	55		I.*	Sh.	In.
	9	6		I.*	Tr.	In.
	11	16		I.*	Sh.	Eg.
	11	26		I.*	Tr.	Eg.
	15	41	46	II.	Ec.	Dis.
	18	55		II.	Oc.	Re.
4	5	54		III.	Sh.	In.
	6	17	16	I.	Ec.	Dis.
	6	31		III.	Tr.	In.
	8	44		I.*	Oc.	Re.
	9	37		III.*	Sh.	Eg.
	10	13		III.*	Tr.	Eg.
5	3	24		I.	Sh.	In.
	3	32		I.	Tr.	In.
	5	44		I.	Sh.	Eg.
	5	52		I.	Tr.	Eg.
	10	44		II.*	Sh.	In.
	10	58		II.*	Tr.	In.
	13	40		II.*	Sh.	Eg.
	13	54		II.*	Tr.	Eg.
6	0	46	0	I.	Ec.	Dis.
	3	10		I.	Oc.	Re.
	21	52		I.	Sh.	In.
	21	57		I.	Tr.	In.
7	0	13		I.	Sh.	Eg.
	0	18		I.	Tr.	Eg.
	4	59	29	II.	Ec.	Dis.
	8	2		II.*	Oc.	Re.
	19	14	38	I.	Ec.	Dis.
	20	9	38	III.	Ec.	Dis.
	21	36		I.	Oc.	Re.
8	0	1		III.	Oc.	Re.
	16	21		I.*	Sh.	In.
	16	23		I.*	Tr.	In.
	18	41		I.	Sh.	Eg.
	18	43		I.	Tr.	Eg.
9	0	2		II.	Sh.	In.
	0	6		II.	Tr.	In.
	2	59		II.	Sh.	Eg.
	3	2		II.	Tr.	Eg.
	13	42		I.*	Oc.	Dis.
	16	2		I.*	Oc.	Re.
10	10	49		I.*	Tr.	In.
	10	50		I.*	Sh.	In.
	13	9		I.*	Tr.	Eg.
	13	10		I.*	Sh.	Eg.
	16	40		IV.	Tr.	In.
	16	50		IV.	Sh.	In.
	18	12		II.	Oc.	Dis.
	21	9		II.	Oc.	Re.
	21	36		IV.	Tr.	Eg.
	21	46		IV.	Sh.	Eg.
11	8	8		I.*	Oc.	Dis.
11	9	47		III.*	Tr.	In.
	9	55		III.*	Sh.	In.
	10	28		I.*	Oc.	Re.
	13	29		III.*	Tr.	Eg.
	13	37		III.*	Sh.	Eg.
12	5	15		I.	Tr.	In.
	5	18		I.	Sh.	In.
	7	35		I.*	Tr.	Eg.
	7	39		I.*	Sh.	Eg.
	13	13		II.*	Tr.	In.
	13	20		II.*	Sh.	In.
	16	9		II.	Tr.	Eg.
	16	17		II.	Sh.	Eg.
13	2	34		I.	Oc.	Dis.
	4	56	41	I.	Ec.	Re.
	23	41		I.	Tr.	In.
	23	47		I.	Sh.	In.
14	2	1		I.	Tr.	Eg.
	2	7		I.	Sh.	Eg.
	7	19		II.	Oc.	Dis.
	10	25	57	II.*	Ec.	Re.
	21	0		I.	Oc.	Dis.
	23	25	20	I.	Ec.	Re.
	23	36		III.	Oc.	Dis.
15	3	44	6	III.	Ec.	Re.
	18	7		I.	Tr.	In.
	18	16		I.	Sh.	In.
	20	27		I.	Tr.	Eg.
	20	36		I.	Sh.	Eg.
16	2	20		II.	Tr.	In.
	2	39		II.	Sh.	In.
	5	17		II.	Tr.	Eg.
	5	36		II.	Sh.	Eg.
	15	26		I.*	Oc.	Dis.
	17	54	4	I.	Ec.	Re.
17	12	33		I.*	Tr.	In.
	12	44		I.*	Sh.	In.
	14	53		I.*	Tr.	Eg.
	15	5		I.*	Sh.	Eg.
	20	26		II.	Oc.	Dis.
	23	43	49	II.	Ec.	Re.
18	9	52		I.*	Oc.	Dis.
	12	22	44	I.*	Ec.	Re.
	13	2		III.*	Tr.	In.
	13	55		III.*	Sh.	In.
	16	44		III.	Tr.	Eg.
	17	38		III.	Sh.	Eg.
	23	6		IV.	Oc.	Dis.
19	6	4	4	IV.	Ec.	Re.
	6	59		I.	Tr.	In.
	7	13		I.	Sh.	In.
	9	19		I.*	Tr.	Eg.
	9	33		I.*	Sh.	Eg.
	15	28		II.	Tr.	In.
	15	57		II.	Sh.	In.
	18	24		II.	Tr.	Eg.
	18	54		II.	Sh.	Eg.
20	4	18		I.	Oc.	Dis.
	6	51	30	I.	Ec.	Re.
21	1	25		I.	Tr.	In.
	1	42		I.	Sh.	In.
	3	45		I.	Tr.	Eg.
	4	2		I.	Sh.	Eg.
	9	33		II.*	Oc.	Dis.
	13	1	57	II.*	Ec.	Re.
21	22	44		I.	Oc.	Dis.
22	1	20	10	I.	Ec.	Re.
	2	52		III.	Oc.	Dis.
	7	44	52	III.*	Ec.	Re.
	19	51		I.	Tr.	In.
	20	10		I.	Sh.	In.
	22	11		I.	Tr.	Eg.
	22	31		I.	Sh.	Eg.
23	4	36		II.	Tr.	In.
	5	16		II.	Sh.	In.
	7	32		II.*	Tr.	Eg.
	8	12		II.*	Sh.	Eg.
	17	10		I.	Oc.	Dis.
	19	48	55	I.	Ec.	Re.
24	14	17		I.*	Tr.	In.
	14	39		I.*	Sh.	In.
	16	37		I.	Tr.	Eg.
	16	59		I.	Sh.	Eg.
	22	41		II.	Oc.	Dis.
25	2	19	56	II.	Ec.	Re.
	11	36		I.*	Oc.	Dis.
	14	17	37	I.*	Ec.	Re.
	16	20		III.	Tr.	In.
	17	56		III.	Sh.	In.
	20	2		III.	Tr.	Eg.
	21	38		III.	Sh.	Eg.
26	8	43		I.*	Tr.	In.
	9	8		I.*	Sh.	In.
	11	3		I.*	Tr.	Eg.
	11	28		I.*	Sh.	Eg.
	17	43		II.	Tr.	In.
	18	34		II.	Sh.	In.
	20	40		II.	Tr.	Eg.
	21	31		II.	Sh.	Eg.
27	6	2		I.	Oc.	Dis.
	6	52		IV.	Tr.	In.
	8	46	24	I.*	Ec.	Re.
	11	2		IV.*	Sh.	In.
	11	47		IV.*	Tr.	Eg.
	15	58		IV.	Sh.	Eg.
28	3	9		I.	Tr.	In.
	3	36		I.	Sh.	In.
	5	30		I.	Tr.	Eg.
	5	57		I.	Sh.	Eg.
	11	49		II.*	Oc.	Dis.
	15	38	14	II.	Ec.	Re.
29	0	28		I.	Oc.	Dis.
	3	15	6	I.	Ec.	Re.
	6	11		III.	Oc.	Dis.
	11	45	56	III.*	Ec.	Re.
	21	35		I.	Tr.	In.
	22	5		I.	Sh.	In.
	23	56		I.	Tr.	Eg.
30	0	25		I.	Sh.	Eg.
	6	52		II.*	Tr.	In.
	7	53		II.*	Sh.	In.
	9	48		II.*	Tr.	Eg.
	10	49		II.*	Sh.	Eg.
	18	55		I.	Oc.	Dis.
	21	43	52	I.	Ec.	Re.
31	16	2		I.	Tr.	In.
	16	34		I.	Sh.	In.
	18	22		I.	Tr.	Eg.
	18	54		I.	Sh.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

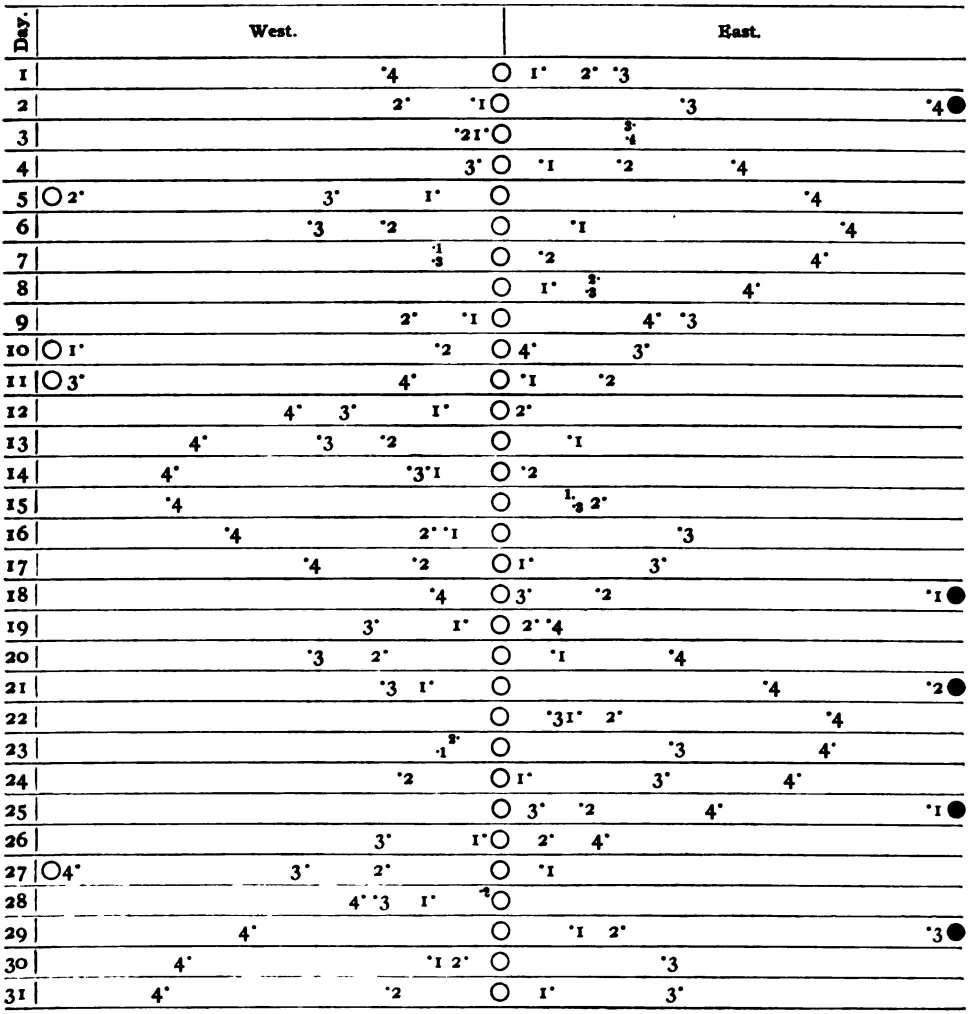
WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 11^h 45^m for an Inverting Telescope.



WASHINGTON MEAN TIME.

OCTOBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	5	26		II.*	Tr.	In.	11	9	37		I.*	Sh.	In.	21	20	50		III.	Tr.	In.
	7	38		II.*	Sh.	In.		10	44		I.*	Tr.	Eg.		23	12		I.	Tr.	In.
	8	22		II.*	Tr.	Eg.		11	52	15	III.*	Ec.	Re.	22	0	31		I.	Sh.	In.
	10	35		II.*	Sh.	Eg.		11	57		I.*	Sh.	Eg.		0	33		III.	Tr.	Eg
	14	57		I.	Oc.	Dis.		21	5		II.	Tr.	In.		1	33		I.	Tr.	Eg
	18	22	4	I.	Ec.	Re.		23	32		II.	Sh.	In.		2	8		III.	Sh.	In.
2	12	5		I.*	Tr.	In.	12	0	2		II.	Tr.	Eg.		2	51		I.	Sh.	Eg
	13	12		I.	Sh.	In.		2	29		II.	Sh.	Eg.		5	48		III.*	Sh.	Eg
	14	25		I.	Tr.	Eg.		5	43		I.	Oc.	Dis.		12	51		II.	Tr.	In
	15	33		I.	Sh.	Eg.		9	14	58	I.*	Ec.	Re.		15	27		II.	Sh.	In
	23	32		II.	Oc.	Dis.	13	2	51		I.	Tr.	In.		15	47		II.	Tr.	Eg
3	4	43	34	II.	Ec.	Re.		4	6		I.	Sh.	In.		18	23		II.	Sh.	Eg
	9	25		I.*	Oc.	Dis.		5	12		I.	Tr.	Eg.		20	32		I.	Oc.	Di
	12	50	51	I.	Ec.	Re.		6	26		I.*	Sh.	Eg.	23	0	7	58	I.	Ec.	Re
	23	35		III.	Oc.	Dis.		15	14		II.	Oc.	Dis.		17	41		I.	Tr.	In.
4	3	18		III.	Oc.	Re.		20	39	54	II.	Ec.	Re.		19	0		I.	Sh.	In.
	4	19	8	III.	Ec.	Dis.	14	0	11		I.	Oc.	Dis.		20	1		I.	Tr.	Eg
	6	32		I.*	Tr.	In.		3	43	47	I.	Ec.	Re.		21	20		I.	Sh.	Eg
	7	41		I.*	Sh.	In.		17	0		III.	Tr.	In.	24	7	3		II.*	Oc.	Di
	7	50	57	III.*	Ec.	Re.		20	43		III.	Tr.	Eg.		12	37	24	II.	Ec.	Re
	8	53		I.*	Tr.	Eg.		21	19		I.	Tr.	In.		13	41		IV.	Oc.	Di
	10	2		I.*	Sh.	Eg.		22	6		III.	Sh.	In.		15	0		I.	Oc.	Di
	18	38		II.	Tr.	In.		22	35		I.	Sh.	In.		18	36	47	I.	Ec.	Re
	20	56		II.	Sh.	In.		23	40		I.	Tr.	Eg.		18	37		IV.	Oc.	Re
	21	34		II.	Tr.	Eg.	15	0	55		I.	Sh.	Eg.	25	2	6	20	IV.	Ec.	Di
	23	52		II.	Sh.	Eg.		1	47		III.	Sh.	Eg.		6	47	1	IV.*	Ec.	Re
5	3	52		I.	Oc.	Dis.		10	20		II.*	Tr.	In.		10	57		III.*	Oc.	Di
	7	19	41	I.*	Ec.	Re.		12	50		II.	Sh.	In.		12	9		I.	Tr.	In.
6	1	0		I.	Tr.	In.		13	16		II.	Tr.	Eg.		13	29		I.	Sh.	In.
	2	10		I.	Sh.	In.		15	47		II.	Sh.	Eg.		14	30		I.	Tr.	E
	3	20		I.	Tr.	Eg.		18	39		I.	Oc.	Dis.		14	40		III.	Oc.	Re
	4	31		I.	Sh.	Eg.		22	12	39	I.	Ec.	Re.		15	49		I.	Sh.	E
	12	45		II.	Oc.	Dis.	16	5	34		IV.	Tr.	In.		16	23	56	III.	Ec.	D
	18	2	5	II.	Ec.	Re.		10	30		IV.*	Tr.	Eg.		19	54	48	III.	Ec.	R
	22	20		I.	Oc.	Dis.		15	48		I.	Tr.	In.	26	2	7		II.	Tr.	In.
7	1	48	28	I.	Ec.	Re.		17	4		I.	Sh.	In.		4	45		II.*	Sh.	In.
	13	15		III.	Tr.	In.		17	44		IV.	Sh.	In.		5	4		II.*	Tr.	E
	16	58		III.	Tr.	Eg.		18	8		I.	Tr.	Eg.		7	41		II.*	Sh.	E
	18	4		III.	Sh.	In.		19	24		I.	Sh.	Eg.		9	28		I.*	Oc.	D
	19	28		I.	Tr.	In.		22	39		IV.	Sh.	Eg.		13	5	37	I.	Ec.	Re
	20	39		I.	Sh.	In.	17	4	30		II.	Oc.	Dis.	27	6	38		I.*	Tr.	In.
	20	40		IV.	Oc.	Dis.		9	59	16	II.*	Ec.	Re.		7	58		I.*	Sh.	In.
	21	46		III.	Sh.	Eg.		13	7		I.	Oc.	Dis.		8	58		I.*	Tr.	E
	21	48		I.	Tr.	Eg.		16	41	27	I.	Ec.	Re.		10	18		I.*	Sh.	E
	23	0		I.	Sh.	Eg.	18	7	6		III.*	Oc.	Dis.		20	20		II.	Oc.	D
8	1	36		IV.	Oc.	Re.		10	16		I.*	Tr.	In.	28	1	56	5	II.	Ec.	Re
	7	51		II.*	Tr.	In.		10	48		III.*	Oc.	Re.		3	57		I.	Oc.	D
	7	53	54	IV.*	Ec.	Dis.		11	33		I.*	Sh.	In.		7	34	26	I.*	Ec.	Re.
	10	14		II.*	Sh.	In.		12	22	34	III.	Ec.	Dis.	29	0	45		III.	Tr.	In.
	10	47		II.*	Tr.	Eg.		12	36		I.	Tr.	Eg.		1	6		I.	Tr.	In.
	12	35	48	IV.	Ec.	Re.		13	53		I.	Sh.	Eg.		2	26		I.	Sh.	In.
	13	10		II.	Sh.	Eg.		15	53	46	III.	Ec.	Re.		3	27		I.	Tr.	Eg.
	16	48		I.	Oc.	Dis.		23	35		II.	Tr.	In.		4	28		III.	Tr.	Eg.
	20	17	20	I.	Ec.	Re.	19	2	9		II.	Sh.	In.		4	47		I.	Sh.	Eg.
9	13	56		I.	Tr.	In.		2	32		II.	Tr.	Eg.		6	10		III.*	Sh.	In.
	15	8		I.	Sh.	In.		5	5		II.*	Sh.	Eg.		9	50		III.*	Sh.	Eg.
	16	16		I.	Tr.	Eg.		7	35		I.*	Oc.	Dis.		15	24		II.	Tr.	In.
	17	28		I.	Sh.	Eg.		11	10	17	I.*	Ec.	Re.		18	3		II.	Sh.	In.
10	1	59		II.	Oc.	Dis.	20	4	44		I.	Tr.	In.		18	21		II.	Tr.	Eg.
	7	21	20	II.*	Ec.	Re.		6	2		I.*	Sh.	In.		20	59		II.	Sh.	Eg.
	11	15		I.*	Oc.	Dis.		7	4		I.*	Tr.	Eg.		22	26		I.	Oc.	D
	14	46	8	I.	Ec.	Re.		8	22		I.*	Sh.	Eg.	30	2	3	18	I.	Ec.	R
11	3	18		III.	Oc.	Dis.		17	46		II.	Oc.	Dis.		19	35		I.	Tr.	I
	7	1		III.*	Oc.	Re.		23	17	55	II.	Ec.	Re.		20	55		I.	Sh.	I
	8	20	44	III.*	Ec.	Dis.	21	2	3		I.	Oc.	Dis.		21	56		I.	Tr.	E
	8	24		I.*	Tr.	In.		5	39	6	I.	Ec.	Re.		23	16		I.	Sh.	E
														31	9	38		II.*	Oc.	D
															15	15	40	II.	Ec.	R
															16	54		I.	Oc.	D
															20	32	6	I.	Ec.	R

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME

[illegible]

Phases of the Eclipses of the Satellites [illegible]

WASHINGTON MEAN TIME.

NOVEMBER.

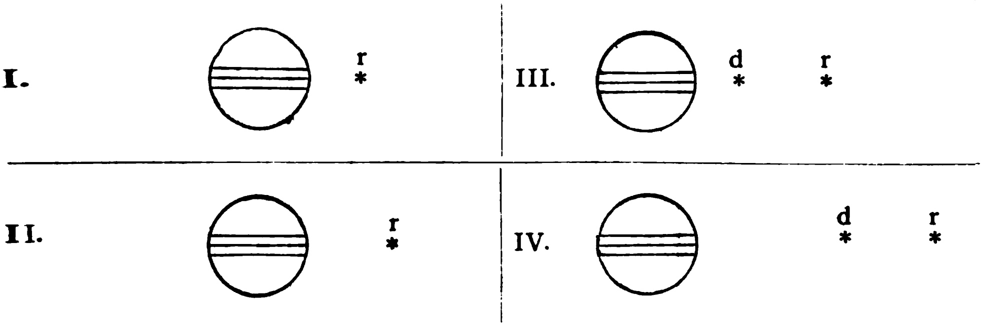
d	h	m	s			
1	14	4		I.	Tr.	In.
	14	54		III.	Oc.	Dis.
	15	24		I.	Sh.	In.
	16	24		I.	Tr.	Eg.
	17	44		I.	Sh.	Eg.
	18	37		III.	Oc.	Re.
	20	25	14	III.	Ec.	Dis.
	23	7		IV.	Tr.	In.
	23	55	45	III.	Ec.	Re.
2	4	3		IV.	Tr.	Eg.
	4	42		II.*	Tr.	In.
	7	21		II.*	Sh.	In.
	7	38		II.*	Tr.	Eg.
	10	17		II.	Sh.	Eg.
	11	23		I.	Oc.	Dis.
	11	59		IV.	Sh.	In.
	15	0	56	I.	Ec.	Re.
	16	53		IV.	Sh.	Eg.
3	8	33		I.*	Tr.	In.
	9	53		I.*	Sh.	In.
	10	53		I.	Tr.	Eg.
	12	13		I.	Sh.	Eg.
	22	56		II.	Oc.	Dis.
4	4	34	23	II.*	Ec.	Re.
	5	52		I.*	Oc.	Dis.
	9	29	45	I.*	Ec.	Re.
5	3	2		I.	Tr.	In.
	4	22		I.	Sh.	In.
	4	45		III.	Tr.	In.
	5	22		I.	Tr.	Eg.
	6	42		I.*	Sh.	Eg.
	8	28		III.*	Tr.	Eg.
	10	12		III.*	Sh.	In.
	13	52		III.	Sh.	Eg.
	18	0		II.	Tr.	In.
	20	39		II.	Sh.	In.
	20	56		II.	Tr.	Eg.
	23	35		II.	Sh.	Eg.
6	0	20		I.	Oc.	Dis.
	3	58	37	I.	Ec.	Re.
	21	31		I.	Tr.	In.
	22	51		I.	Sh.	In.
	23	51		I.	Tr.	Eg.
7	1	11		I.	Sh.	Eg.
	12	16		II.	Oc.	Dis.
	17	54	3	II.	Ec.	Re.
	18	49		I.	Oc.	Dis.
	22	27	25	I.	Ec.	Re.
8	16	0		I.	Tr.	In.
	17	20		I.	Sh.	In.
	18	20		I.	Tr.	Eg.
	18	55		III.	Oc.	Dis.
	19	40		I.	Sh.	Eg.
	22	38		III.	Oc.	Re.
9	0	26	46	III.	Ec.	Dis.
	3	56	55	III.	Ec.	Re.
	7	18		II.*	Tr.	In.
	9	57		II.*	Sh.	In.
	10	14		II.*	Tr.	Eg.
	12	53		II.	Sh.	Eg.
	13	18		I.	Oc.	Dis.
	16	56	15	I.	Ec.	Re.
10	7	42		IV.*	Oc.	Dis.
	10	29		I.	Tr.	In.
	11	49		I.	Sh.	In.
	12	38		IV.	Oc.	Re.
10	12	49		I.	Tr.	Eg.
	14	9		I.	Sh.	Eg.
	20	19	49	IV.	Ec.	Dis.
11	0	58	54	IV.	Ec.	Re.
	1	35		II.	Oc.	Dis.
	7	12	48	II.*	Ec.	Re.
	7	47		I.*	Oc.	Dis.
	11	25	3	I.	Ec.	Re.
12	4	58		I.	Tr.	In.
	6	18		I.*	Sh.	In.
	7	18		I.*	Tr.	Eg.
	8	38		I.*	Sh.	Eg.
	8	49		III.*	Tr.	In.
	12	32		III.	Tr.	Eg.
	14	15		III.	Sh.	In.
	17	54		III.	Sh.	Eg.
	20	37		II.	Tr.	In.
	23	15		II.	Sh.	In.
	23	33		II.	Tr.	Eg.
13	2	11		II.	Sh.	Eg.
	2	16		I.	Oc.	Dis.
	5	53	55	I.*	Ec.	Re.
	23	27		I.	Tr.	In.
14	0	47		I.	Sh.	In.
	1	48		I.	Tr.	Eg.
	3	7		I.	Sh.	Eg.
	14	56		II.	Oc.	Dis.
	20	32	32	II.	Ec.	Re.
	20	45		I.	Oc.	Dis.
15	0	22	43	I.	Ec.	Re.
	17	56		I.	Tr.	In.
	19	16		I.	Sh.	In.
	20	17		I.	Tr.	Eg.
	21	36		I.	Sh.	Eg.
	23	1		III.	Oc.	Dis.
16	2	43		III.	Oc.	Re.
	4	28	24	III.	Ec.	Dis.
	7	58	9	III.*	Ec.	Re.
	9	56		II.	Tr.	In.
	12	33		II.	Sh.	In.
	12	53		II.	Tr.	Eg.
	15	15		I.	Oc.	Dis.
	15	29		II.	Sh.	Eg.
	18	51	32	I.	Ec.	Re.
17	12	26		I.	Tr.	In.
	13	45		I.	Sh.	In.
	14	46		I.	Tr.	Eg.
	16	5		I.	Sh.	Eg.
18	4	16		II.*	Oc.	Dis.
	9	44		I.*	Oc.	Dis.
	9	51	18	II.	Ec.	Re.
	13	20	20	I.	Ec.	Re.
	17	38		IV.	Tr.	In.
	22	34		IV.	Tr.	Eg.
19	6	15		IV.*	Sh.	In.
	6	55		I.*	Tr.	In.
	8	14		I.*	Sh.	In.
	9	16		I.*	Tr.	Eg.
	10	34		I.	Sh.	Eg.
	11	7		IV.	Sh.	Eg.
	12	57		III.	Tr.	In.
	16	39		III.	Tr.	Eg.
	18	16		III.	Sh.	In.
	21	56		III.	Sh.	Eg.
	23	16		II.	Tr.	In.
20	1	51		II.	Sh.	In.
20	2	12		II.	Tr.	
	4	13		I.	Oc.	
	4	47		II.*	Sh.	
	7	49	11	I.*	Ec.	
21	1	25		I.	Tr.	
	2	43		I.	Sh.	
	3	45		I.	Tr.	
	5	3		I.	Sh.	
	17	38		II.	Oc.	
	22	42		I.	Oc.	
	23	11	6	II.	Ec.	
22	2	18	0	I.	Ec.	
	19	54		I.	Tr.	
	21	12		I.	Sh.	
	22	15		I.	Tr.	
	23	32		I.	Sh.	
23	3	10		III.	Oc.	
	6	53		III.*	Oc.	
	8	30	40	III.*	Ec.	
	11	59	59	III.	Ec.	
	12	36		II.	Tr.	
	15	9		II.	Sh.	
	15	32		II.	Tr.	
	17	12		I.	Oc.	
	18	5		II.	Sh.	
	20	46	48	I.	Ec.	
24	14	24		I.	Tr.	
	15	41		I.	Sh.	
	16	44		I.	Tr.	
	18	1		I.	Sh.	
25	6	59		II.*	Oc.	
	11	41		I.	Oc.	
	12	29	52	II.	Ec.	
	15	15	36	I.	Ec.	
26	8	53		I.*	Tr.	
	10	10		I.	Sh.	
	11	14		I.	Tr.	
	12	30		I.	Sh.	
	17	8		III.	Tr.	
	20	51		III.	Tr.	
	22	18		III.	Sh.	
27	1	57		III.	Sh.	
	1	57		II.	Tr.	
	2	34		IV.	Oc.	
	4	27		II.*	Sh.	
	4	53		II.*	Tr.	
	6	11		I.*	Oc.	
	7	23		II.*	Sh.	
	7	30		IV.*	Oc.	
	9	44	26	I.	Ec.	
	14	33	7	IV.	Ec.	
	19	10	12	IV.	Ec.	
28	3	23		I.	Tr.	
	4	39		I.	Sh.	
	5	44		I.*	Tr.	
	6	59		I.*	Sh.	
	20	21		II.	Oc.	
29	0	40		I.	Oc.	
	1	49	43	II.	Ec.	
	4	13	14	I.	Ec.	
	21	53		I.	Tr.	
	23	8		I.	Sh.	
30	0	13		I.	Tr.	
	1	28		I.	Sh.	
	7	24		III.*	Oc.	
	11	6		III.	Oc.	
	12	32	23	III.	Ec.	
	15	17		II.	Tr.	
	16	1	16	III.	Ec.	
	17	44		II.	Sh.	
	18	14		II.	Tr.	
	19	10		I.	Oc.	
	20	41		II.	Sh.	
	22	42	2	I.	Ec.	

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; *Visible at Washin

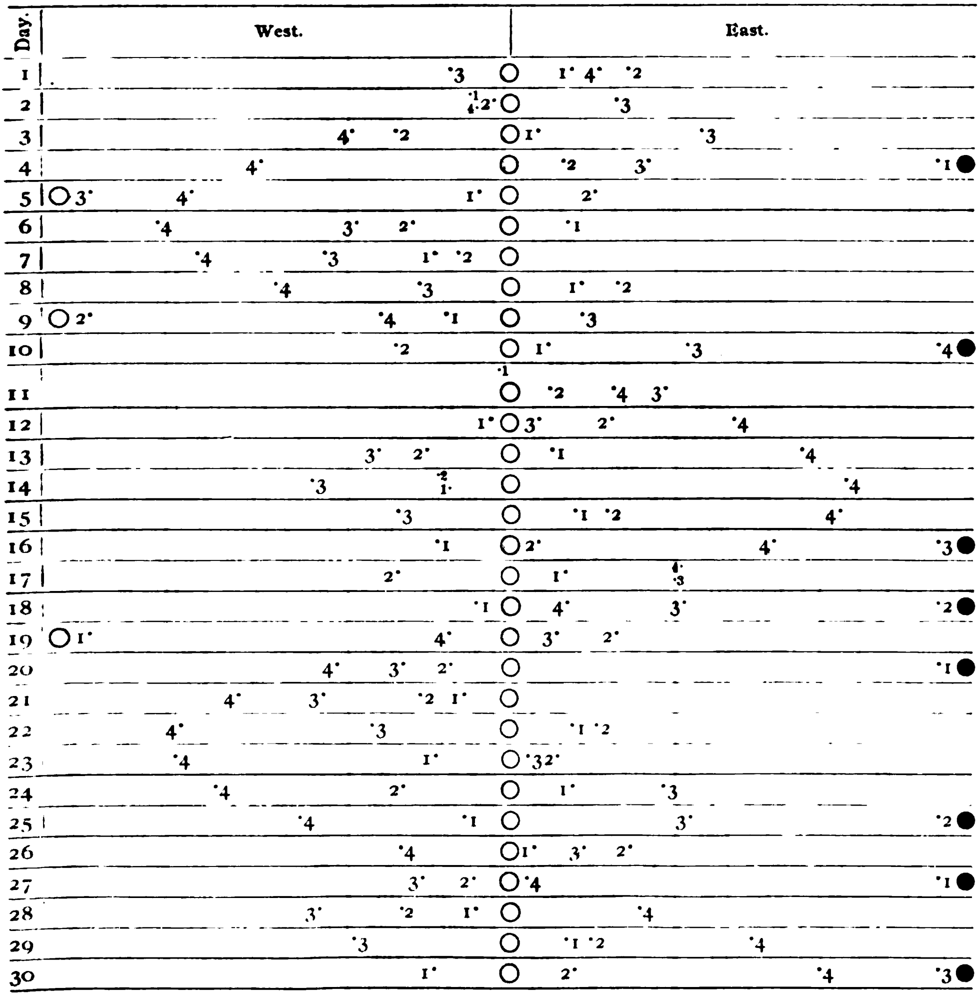
WASHINGTON MEAN TIME.

NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at $7^h\ 45^m$ for an Inverting Telescope.



WASHINGTON MEAN TIME.

DECEMBER.

d	h	m	s			
1	16	23		I.	Tr.	In.
	17	37		I.	Sh.	In.
	18	43		I.	Tr.	Eg.
	19	57		I.	Sh.	Eg.
2	9	43		II.	Oc.	Dis.
	13	40		I.	Oc.	Dis.
	15	8	29	II.	Ec.	Re.
	17	10	49	I.	Ec.	Re.
3	10	52		I.	Tr.	In.
	12	6		I.	Sh.	In.
	13	13		I.	Tr.	Eg.
	14	26		I.	Sh.	Eg.
	21	23		III.	Tr.	In.
4	1	5		III.	Tr.	Eg.
	2	20		III.	Sh.	In.
	4	39		II.*	Tr.	In.
	5	58		III.*	Sh.	Eg.
	7	2		II.*	Sh.	In.
	7	35		II.*	Tr.	Eg.
	8	9		I.*	Oc.	Dis.
	9	59		II.	Sh.	Eg.
	11	39	38	I.	Ec.	Re.
5	5	22		I.*	Tr.	In.
	6	35		I.*	Sh.	In.
	7	42		I.*	Tr.	Eg.
	8	55		I.*	Sh.	Eg.
	12	57		IV.	Tr.	In.
	17	53		IV.	Tr.	Eg.
	23	7		II.	Oc.	Dis.
6	0	31		IV.	Sh.	In.
	2	39		I.	Oc.	Dis.
	4	28	21	II.*	Ec.	Re.
	5	21		IV.*	Sh.	Eg.
	6	8	26	I.*	Ec.	Re.
	23	52		I.	Tr.	In.
7	1	4		I.	Sh.	In.
	2	12		I.	Tr.	Eg.
	3	24		I.	Sh.	Eg.
	11	40		III.	Oc.	Dis.
	15	22		III.	Oc.	Re.
	16	34	14	III.	Ec.	Dis.
	18	0		II.	Tr.	In.
	20	2	40	III.	Ec.	Re.
	20	20		II.	Sh.	In.
	20	57		II.	Tr.	Eg.
	21	9		I.	Oc.	Dis.
	23	16		II.	Sh.	Eg.
8	0	37	12	I.	Ec.	Re.
	18	22		I.	Tr.	In.
	19	33		I.	Sh.	In.
	20	42		I.	Tr.	Eg.
	21	53		I.	Sh.	Eg.
9	12	30		II.	Oc.	Dis.
	15	39		I.	Oc.	Dis.
	17	47	7	II.	Ec.	Re.
	19	5	59	I.	Ec.	Re.
10	12	52		I.	Tr.	In.
	14	2		I.	Sh.	In.
	15	12		I.	Tr.	Eg.
	16	22		I.	Sh.	Eg.
11	1	41		III.	Tr.	In.
	5	23		III.*	Tr.	Eg.
	6	22		III.*	Sh.	In.
	7	22		II.*	Tr.	In.
	9	38		II.	Sh.	In.
	10	0		III.	Sh.	Eg.

d	h	m	s			
11	10	9		I.	Oc.	Dis.
	10	19		II.	Tr.	Eg.
	12	34		II.	Sh.	Eg.
	13	34	47	I.	Ec.	Re.
12	7	22		I.*	Tr.	In.
	8	30		I.*	Sh.	In.
	9	42		I.	Tr.	Eg.
	10	50		I.	Sh.	Eg.
13	1	54		II.	Oc.	Dis.
	4	38		I.	Oc.	Dis.
	7	7	0	II.*	Ec.	Re.
	8	3	34	I.*	Ec.	Re.
	22	9		IV.	Oc.	Dis.
14	1	52		I.	Tr.	In.
	3	0		I.	Sh.	In.
	3	5		IV.	Oc.	Re.
	4	12		I.	Tr.	Eg.
	5	19		I.*	Sh.	Eg.
	8	46	39	IV.	Ec.	Dis.
	13	21	21	IV.	Ec.	Re.
	15	58		III.	Oc.	Dis.
	19	41		III.	Oc.	Re.
	20	35	35	III.	Ec.	Dis.
	20	45		II.	Tr.	In.
	22	56		II.	Sh.	In.
	23	8		I.	Oc.	Dis.
	23	41		II.	Tr.	Eg.
15	0	3	31	III.	Ec.	Re.
	1	52		II.	Sh.	Eg.
	2	32	21	I.	Ec.	Re.
	20	22		I.	Tr.	In.
	21	28		I.	Sh.	In.
	22	43		I.	Tr.	Eg.
	23	48		I.	Sh.	Eg.
16	15	17		II.	Oc.	Dis.
	17	38		I.	Oc.	Dis.
	20	25	45	II.	Ec.	Re.
	21	1	6	I.	Ec.	Re.
17	14	52		I.	Tr.	In.
	15	57		I.	Sh.	In.
	17	13		I.	Tr.	Eg.
	18	17		I.	Sh.	Eg.
18	6	3		III.*	Tr.	In.
	9	45		III.	Tr.	Eg.
	10	7		II.	Tr.	In.
	10	25		III.	Sh.	In.
	12	8		I.	Oc.	Dis.
	12	14		II.	Sh.	In.
	13	4		II.	Tr.	Eg.
	14	2		III.	Sh.	Eg.
	15	10		II.	Sh.	Eg.
	15	29	54	I.	Ec.	Re.
19	9	23		I.	Tr.	In.
	10	26		I.	Sh.	In.
	11	43		I.	Tr.	Eg.
	12	46		I.	Sh.	Eg.
20	4	42		II.	Oc.	Dis.
	6	38		I.*	Oc.	Dis.
	9	45	37	II.	Ec.	Re.
	9	58	40	I.	Ec.	Re.
21	3	53		I.	Tr.	In.
	4	55		I.	Sh.	In.
	6	13		I.*	Tr.	Eg.
	7	15		I.*	Sh.	Eg.
	20	20		III.	Oc.	Dis.
	23	30		II.	Tr.	In.

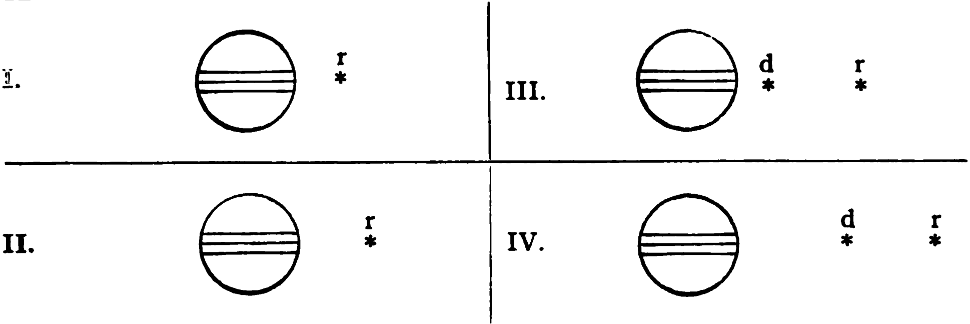
d	h	m	s			
22	0	2		III.	Oc.	R
	0	36	49	III.	Ec.	D
	1	8		I.	Oc.	D
	1	32		II.	Sh.	I
	2	26		II.	Tr.	E
	4	4	15	III.	Ec.	R
	4	27	26	I.	Ec.	R
	4	28		II.	Sh.	E
	8	56		IV.	Tr.	I
	13	51		IV.	Tr.	E
	18	47		IV.	Sh.	I
	22	23		I.	Tr.	I
	23	24		I.	Sh.	I
	23	34		IV.	Sh.	E
23	0	43		I.	Tr.	E
	1	44		I.	Sh.	E
	18	6		II.	Oc.	D
	19	39		I.	Oc.	D
	22	56	11	I.	Ec.	R
	23	4	20	II.	Ec.	R
24	16	54		I.	Tr.	I
	17	53		I.	Sh.	I
	19	14		I.	Tr.	E
	20	13		I.	Sh.	E
25	10	26		III.	Tr.	In
	12	53		II.	Tr.	In
	14	8		III.	Tr.	E
	14	9		I.	Oc.	D
	14	27		III.	Sh.	In
	14	49		II.	Sh.	In
	15	49		II.	Tr.	E
	17	24	57	I.	Ec.	R
	17	45		II.	Sh.	E
	18	4		III.	Sh.	E
26	11	24		I.	Tr.	In
	12	22		I.	Sh.	In
	13	44		I.	Tr.	E
	14	42		I.	Sh.	E
27	7	32		II.	Oc.	Di
	8	39		I.	Oc.	Di
	11	53	43	I.	Ec.	Re
	12	24	11	II.	Ec.	Re
28	5	54		I.*	Tr.	In
	6	51		I.*	Sh.	In
	8	14		I.	Tr.	E
	9	11		I.	Sh.	E
29	0	44		III.	Oc.	Di
	2	16		II.	Tr.	In.
	3	9		I.	Oc.	Dis
	4	7		II.	Sh.	In.
	4	26		III.	Oc.	Re.
	4	38	16	III.	Ec.	Dis
	5	13		II.*	Tr.	Eg.
	6	22	27	I.*	Ec.	Re.
	7	3		II.	Sh.	Eg.
	8	5	10	III.	Ec.	Re.
30	0	24		I.	Tr.	In.
	1	20		I.	Sh.	In.
	2	45		I.	Tr.	Eg.
	3	40		I.	Sh.	Eg.
	18	19		IV.	Oc.	Dis.
	20	57		II.	Oc.	Dis.
	21	39		I.	Oc.	Dis.
	23	14		IV.	Oc.	Re.
31	0	51	12	I.	Ec.	Re.
	1	42	52	II.	Ec.	Re.
	3	0	45	IV.	Ec.	Dis.
	7	32	39	IV.*	Ec.	Re.
	18	55		I.	Tr.	In.
	19	49		I.	Sh.	In.
	21	15		I.	Tr.	Eg.
	22	9		I.	Sh.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; *Visible at Washington.

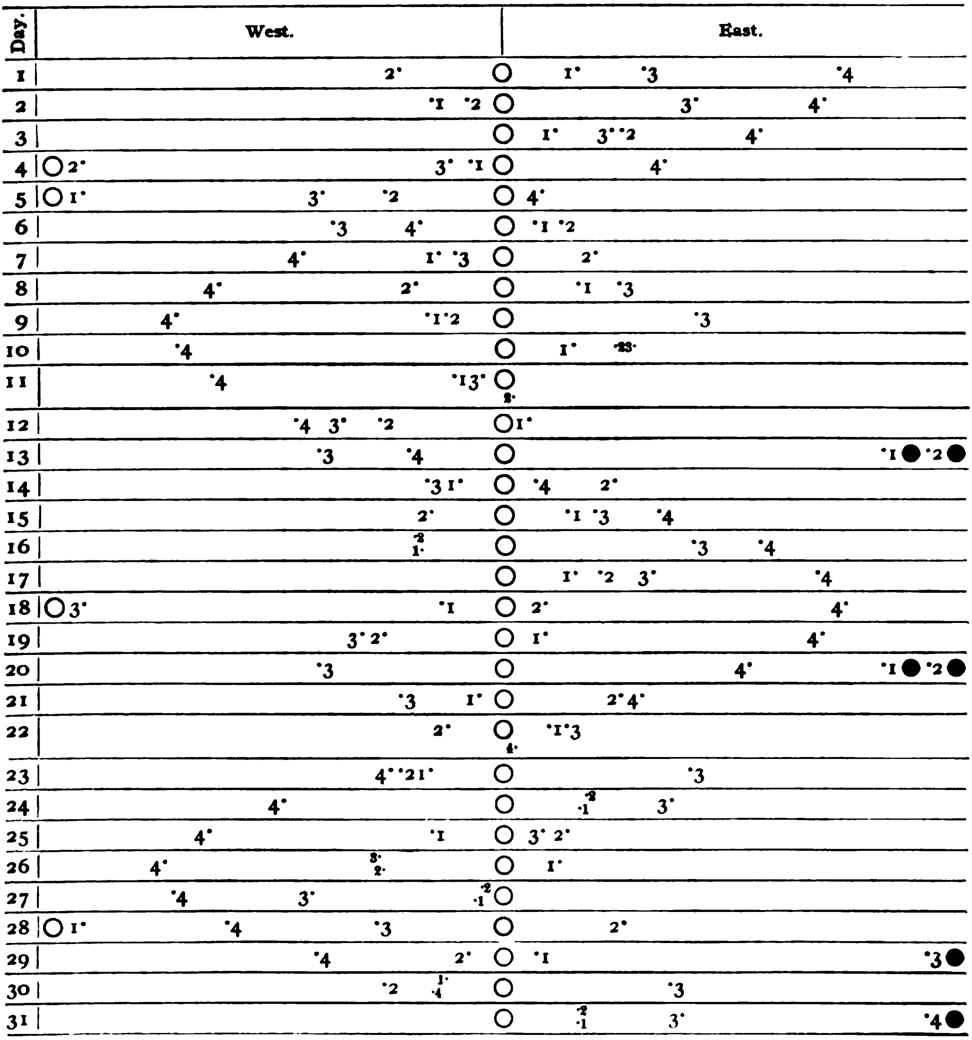
WASHINGTON MEAN TIME.

DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 7h 0m for an Inverting Telescope.



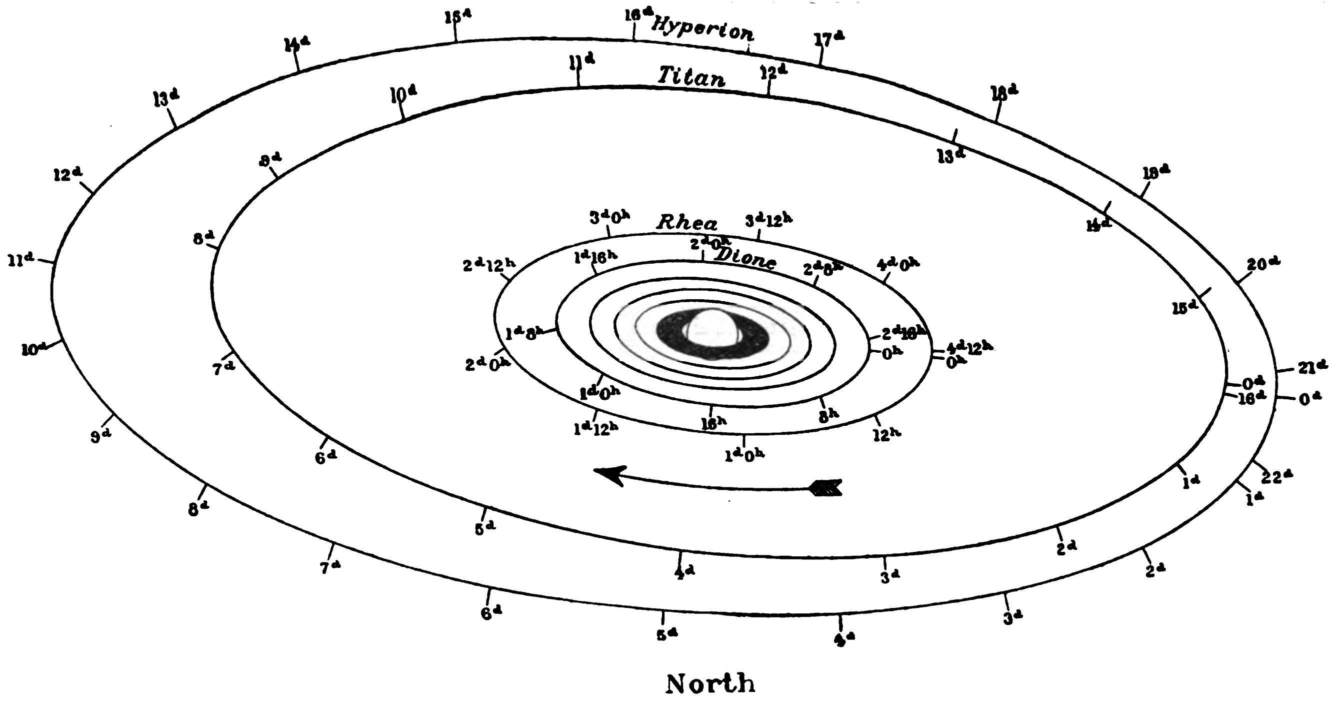
ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION, APPEARANCE, AND MAGNITUDE OF SATURN'S RINGS.

Washington Mean Noon.		*a* Outer Major Axis.	*b* Outer Minor Axis.	*p* Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	*l* The Elevation of the Earth above the Plane of the Rings.	*l′* The Elevation of the Sun above the Plane of the Rings.	*u* Earth's Longitude from Saturn counted on Plane of Rings from the Rings' Ascending Node on—	*u′*
							Equator.	Ecliptic.
		″	″	° ′	° ′	° ′	° ′	° ′
Jan.	0	46.07	−20.39	−4 20.5	−26 16.3	−26 32.6	126 20.3	83 50.9
	10	45.57	20.17	4 16.1	26 16.3	26 34.0	125 38.2	83 8.9
	20	44.96	19.91	4 12.6	26 16.8	26 35.2	125 5.6	82 36.4
	30	44.26	19.61	4 10.3	26 18.0	26 36.3	124 44.2	82 15.0
Feb.	9	43.49	19.29	4 9.4	26 19.9	26 37.3	124 34.9	82 5.7
	19	42.70	−18.97	−4 9.8	−26 22.6	−26 38.3	124 38.2	82 9.1
Mar.	1	41.91	18.66	4 11.6	26 26.0	26 39.3	124 54.1	82 25.1
	11	41.15	18.36	4 14.7	26 29.9	26 40.1	125 22.1	82 53.1
	21	40.43	18.08	4 19.0	26 34.1	26 40.9	126 1.3	83 32.4
	31	39.77	17.83	4 24.3	26 38.4	26 41.6	126 50.8	84 21.9
Apr.	10	39.18	−17.61	−4 30.5	−26 42.4	−26 42.3	127 49.3	85 20.5
	20	38.67	17.42	4 37.5	26 46.3	26 42.9	128 55.8	86 27.0
	30	38.24	17.26	4 45.0	26 49.5	26 43.4	130 8.9	87 40.2
May	10	37.90	17.13	4 52.9	26 51.9	26 43.8	131 27.4	88 58.7
	20	37.64	17.02	5 1.1	26 53.4	26 44.1	132 49.9	90 21.3
	30	37.47	−16.95	−5 9.4	−26 53.7	−26 44.4	134 15.3	91 46.7
June	9	37.39	16.91	5 17.6	26 53.0	26 44.6	135 42.3	93 13.8
	19	37.40	16.90	5 25.6	26 51.2	26 44.7	137 9.9	94 41.4
	29	37.49	16.91	5 33.3	26 48.4	26 44.7	138 36.6	96 8.2
July	9	37.67	16.95	5 40.6	26 44.6	26 44.7	140 1.3	97 33.0
	19	37.95	−17.03	−5 47.4	−26 39.9	−26 44.6	141 22.8	98 54.6
	29	38.31	17.14	5 53.6	26 34.6	26 44.4	142 40.1	100 11.9
Aug.	8	38.75	17.28	5 59.2	26 29.0	26 44.2	143 51.8	101 23.6
	18	39.27	17.45	6 4.1	26 23.2	26 43.9	144 56.8	102 28.7
	28	39.86	17.66	6 8.4	26 17.5	26 43.5	145 53.9	103 25.9
Sept.	7	40.52	−17.90	−6 11.9	−26 12.3	−26 43.0	146 42.1	104 14.1
	17	41.24	18.16	6 14.5	26 7.9	26 42.5	147 20.3	104 52.3
	27	42.00	18.45	6 16.3	26 4.5	26 41.9	147 47.5	105 19.5
Oct.	7	42.79	18.78	6 17.4	26 2.3	26 41.2	148 2.9	105 35.0
	17	43.58	19.12	6 17.6	26 1.6	26 40.5	148 6.2	105 38.4
	27	44.34	−19.46	−6 16.9	−26 2.3	−26 39.6	147 57.2	105 29.4
Nov.	6	45.05	19.79	6 15.4	26 4.5	26 38.7	147 36.2	105 8.5
	16	45.67	20.11	6 13.2	26 7.9	26 37.7	147 4.2	104 36.6
	26	46.16	20.39	6 10.3	26 12.4	26 36.6	146 22.8	103 55.2
Dec.	6	46.51	20.61	6 6.8	26 17.8	26 35.5	145 34.1	103 6.5
	16	46.69	−20.76	−6 2.9	−26 23.6	−26 34.3	144 40.7	102 13.2
	26	46.68	20.82	5 58.7	26 29.3	26 33.1	143 45.6	101 18.2
	31	46.61	−20.82	−5 56.6	−26 32.1	−26 32.4	143 18.5	100 51.1

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring=0.8801,	log factor=9.9445
The outer ellipse of the inner ring=0.8599,	log factor=9.9344
The inner ellipse of the inner ring=0.6650,	log factor=9.8228
The inner ellipse of the dusky ring=0.5486,	log factor=9.7392

NOTE.—The negative sign of *l* indicates that the visible surface of the rings is the southern one.



Names of the Satellites.	
I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Iapetus.
IX.	Phœbe.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT DATE OF OPPOSITION, DECEMBER 20, 1914,

AS SEEN IN AN INVERTING TELESCOPE.

Mean Synodic Periods.	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1
IX.	580	2.9

WASHINGTON MEAN TIME OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "*o*" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as circular, and the time of any elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. Mimas can be seen only within a few hours of each elongation, and the time of every elongation visible at Washington is given. For the three outer satellites the eccentricity is taken into account, and the times both of the elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., East Elongation.	I., Inferior Conjunction (north of planet).
W., West Elongation.	S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible at Washington.

	d h		d h		d h		d h		d h		d h
Jan.	1 10.0 E.	Jan.	24 12.1 W.	Sept.	26 14.4 W.	Oct.	29 13.9 W.	Nov.	23 13.1 E.	Dec.	14 6.5 E.
	2 8.6 E.		25 10.7 W.		27 13.0 W.		30 12.6 W.		24 11.7 E.		14 18.0 W.
	3 7.3 E.		26 9.4 W.		28 11.6 W.		31 11.2 W.		25 10.3 E.		15 16.7 W.
	4 5.9 E.		27 8.0 W.	Oct.	2 17.3 E.	Nov.	1 9.8 W.		26 8.9 E.		16 15.2 W.
	5 15.8 W.		28 6.6 W.		3 15.9 E.		4 16.8 E.		27 7.5 E.		17 13.8 W.
	6 14.5 W.		31 13.8 E.		4 14.5 E.		5 15.4 E.		28 17.6 W.		18 12.4 W.
	7 13.1 W.	Feb.	1 12.4 E.		5 13.1 E.		6 14.0 E.		29 16.2 W.		19 11.0 W.
	8 11.7 W.		2 11.0 E.		6 11.7 E.		7 12.6 E.		30 14.8 W.		20 9.6 W.
	9 10.3 W.		3 9.6 E.		7 10.4 E.		8 11.2 E.	Dec.	1 13.4 W.		21 8.2 W.
	10 8.9 W.		4 8.2 E.		11 16.3 W.		9 9.9 E.		2 12.0 W.		22 6.8 W.
	11 7.5 W.		5 6.9 E.		12 14.9 W.		10 8.5 E.		3 10.6 W.		22 18.1 E.
	12 6.1 W.		8 14.0 W.		13 13.5 W.		12 17.2 W.		4 9.2 W.		23 5.4 W.
	13 16.0 E.		9 12.6 W.		14 12.1 W.		13 15.8 W.		5 7.8 W.		23 16.7 E.
	14 14.7 E.		10 11.2 W.		15 10.7 W.		14 14.4 W.		6 6.5 W.		24 15.3 E.
	15 13.3 E.		11 9.8 W.		19 16.4 E.		15 13.0 W.		6 17.6 E.		25 13.9 E.
	16 11.9 E.		12 8.4 W.		20 15.0 E.		16 11.6 W.		7 16.2 E.		26 12.5 E.
	17 10.5 E.		13 7.1 W.		21 13.6 E.		17 10.2 W.		8 14.9 E.		27 11.1 E.
	18 9.1 E.		17 12.9 E.		22 12.2 E.		18 8.8 W.		9 13.5 E.		28 9.7 E.
	19 7.8 E.		18 11.5 E.		23 10.8 E.		19 7.5 W.		10 12.1 E.		29 8.3 E.
	20 6.4 E.		. . . .		24 9.4 E.		20 17.2 E.		11 10.7 E.		30 6.9 E.
	22 14.9 W.	Sept.	24 17.1 W.		27 16.7 W.		21 15.8 E.		12 9.3 E.		31 5.6 E.
	23 13.5 W.		25 15.8 W.		28 15.3 W.		22 14.5 E.		13 7.9 E.		31 16.9 W.

ENCELADUS.

	d h		d h		d h		d h		d h		d h
Jan.	1 18.2 E.	Jan.	15 10.9 E.	Jan.	29 3.8 E.	Feb.	11 20.6 E.	Feb.	25 13.5 E.	Mar.	11 6.5 E.
	3 3.0 E.		16 19.8 E.		30 12.6 E.		13 5.5 E.		26 22.4 E.		12 15.4 E.
	4 11.9 E.		18 4.7 E.		31 21.5 E.		14 14.4 E.		28 7.3 E.		14 0.2 E.
	5 20.8 E.		19 13.6 E.	Feb.	2 6.4 E.		15 23.3 E.	Mar.	1 16.2 E.		15 9.1 E.
	7 5.7 E.		20 22.5 E.		3 15.3 E.		17 8.2 E.		3 1.1 E.		16 18.0 E.
	8 14.6 E.		22 7.4 E.		5 0.2 E.		18 17.1 E.		4 10.0 E.		18 3.0 E.
	9 23.4 E.		23 16.2 E.		6 9.1 E.		20 2.0 E.		5 18.9 E.		19 11.8 E.
	11 8.3 E.		25 1.1 E.		7 18.0 E.		21 10.9 E.		7 3.8 E.		20 20.7 E.
	12 17.2 E.		26 10.0 E.		9 2.9 E.		22 19.8 E.		8 12.7 E.		22 5.6 E.
	14 2.1 E.		27 18.9 E.		10 11.8 E.		24 4.6 E.		9 21.6 E.		23 14.5 E.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ENCELADUS—(*Concluded*).

	d h		d h		d h		d h		d h		d h
Mar.	24 23.4 E.	Sept.	20 13.3 E.	Oct.	11 2.6 E.	Oct.	31 15.8 E.	Nov.	21 5.0 E.	Dec.	11 18.0 E.
	....		21 22.2 E.		12 11.4 E.	Nov.	2 0.7 E.		22 13.8 E.		13 2.9 E.
Sept.	2 17.7 E.		23 7.1 E.		13 20.3 E.		3 9.5 E.		23 22.7 E.		14 11.8 E.
	4 2.6 E.		24 16.0 E.		15 5.2 E.		4 18.4 E.		25 7.6 E.		15 20.6 E.
	5 11.5 E.		26 0.8 E.		16 14.1 E.		6 3.3 E.		26 16.4 E.		17 5.5 E.
	6 20.4 E.		27 9.7 E.		17 23.0 E.		7 12.2 E.		28 1.3 E.		18 14.4 E.
	8 5.3 E.		28 18.6 E.		19 7.9 E.		8 21.0 E.		29 10.2 E.		19 23.3 E.
	9 14.2 E.		30 3.5 E.		20 16.8 E.		10 5.9 E.		30 19.1 E.		21 8.1 E.
	10 23.1 E.	Oct.	1 12.4 E.		22 1.6 E.		11 14.8 E.	Dec.	2 3.9 E.		22 17.0 E.
	12 8.0 E.		2 21.3 E.		23 10.5 E.		12 23.7 E.		3 12.8 E.		24 1.9 E.
	13 16.8 E.		4 6.2 E.		24 19.4 E.		14 8.6 E.		4 21.7 E.		25 10.8 E.
	15 1.7 E.		5 15.0 E.		26 4.3 E.		15 17.4 E.		6 6.6 E.		26 19.6 E.
	16 10.6 E.		6 23.9 E.		27 13.2 E.		17 2.3 E.		7 15.4 E.		28 4.5 E.
	17 19.5 E.		8 8.8 E.		28 22.0 E.		18 11.2 E.		9 0.3 E.		29 13.4 E.
	19 4.4 E.		9 17.7 E.		30 6.9 E.		19 20.1 E.		10 9.2 E.		30 22.3 E.

TETHYS.

	d h		d h		d h		d h		d h		d h
Jan.	1 18.6 E.	Feb.	6 15.3 E.	Mar.	14 12.3 E.	Sept.	15 15.2 E.	Oct.	21 12.0 E.	Nov.	26 8.6 E.
	3 15.9 E.		8 12.6 E.		16 9.6 E.		17 12.5 E.		23 9.3 E.		28 5.8 E.
	5 13.2 E.		10 9.9 E.		18 7.0 E.		19 9.8 E.		25 6.6 E.		30 3.1 E.
	7 10.5 E.		12 7.2 E.		20 4.3 E.		21 7.1 E.		27 3.9 E.	Dec.	2 0.4 E.
	9 7.8 E.		14 4.5 E.		22 1.6 E.		23 4.4 E.		29 1.2 E.		3 21.7 E.
	11 5.1 E.		16 1.8 E.		23 23.0 E.		25 1.7 E.		30 22.5 E.		5 19.0 E.
	13 2.4 E.		17 23.2 E.		25 20.3 E.		26 23.0 E.	Nov.	1 19.8 E.		7 16.3 E.
	14 23.7 E.		19 20.5 E.		27 17.6 E.		28 20.4 E.		3 17.1 E.		9 13.6 E.
	16 21.0 E.		21 17.8 E.		....		30 17.7 E.		5 14.4 E.		11 10.9 E.
	18 18.2 E.		23 15.1 E.	Aug.	27 18.0 E.	Oct.	2 15.0 E.		7 11.7 E.		13 8.2 E.
	20 15.5 E.		25 12.4 E.		29 15.3 E.		4 12.3 E.		9 9.0 E.		15 5.4 E.
	22 12.8 E.		27 9.7 E.		31 12.6 E.		6 9.6 E.		11 6.3 E.		17 2.7 E.
	24 10.1 E.	Mar.	1 7.1 E.	Sept.	2 9.9 E.		8 6.9 E.		13 3.6 E.		19 0.0 E.
	26 7.4 E.		3 4.4 E.		4 7.2 E.		10 4.2 E.		15 0.8 E.		20 21.3 E.
	28 4.7 E.		5 1.7 E.		6 4.6 E.		12 1.5 E.		16 22.1 E.		22 18.6 E.
	30 2.0 E.		6 23.0 E.		8 1.9 E.		13 22.8 E.		18 19.4 E.		24 15.9 E.
	31 23.4 E.		8 20.3 E.		9 23.2 E.		15 20.1 E.		20 16.7 E.		26 13.2 E.
Feb.	2 20.7 E.		10 17.7 E.		11 20.5 E.		17 17.4 E.		22 14.0 E.		28 10.4 E.
	4 18.0 E.		12 15.0 E.		13 17.8 E.		19 14.7 E.		24 11.3 E.		30 7.7 E.

DIONE.

	d h		d h		d h		d h		d h		d h
Jan.	1 21.6 E.	Feb.	6 11.3 E.	Mar.	14 1.5 E.	Sept.	16 8.1 E.	Oct.	21 22.1 E.	Nov.	26 11.6 E.
	4 15.3 E.		9 5.0 E.		16 19.2 E.		19 1.8 E.		24 15.8 E.		29 5.3 E.
	7 9.0 E.		11 22.7 E.		19 13.0 E.		21 19.5 E.		27 9.4 E.	Dec.	1 22.9 E.
	10 2.6 E.		14 16.4 E.		22 6.7 E.		24 13.2 E.		30 3.1 E.		4 16.6 E.
	12 20.3 E.		17 10.1 E.		25 0.4 E.		27 6.9 E.	Nov.	1 20.8 E.		7 10.2 E.
	15 13.9 E.		20 3.8 E.		27 18.1 E.		30 0.6 E.		4 14.4 E.		10 3.9 E.
	18 7.6 E.		22 21.5 E.		....	Oct.	2 18.3 E.		7 8.1 E.		12 21.5 E.
	21 1.3 E.		25 15.2 E.	Aug.	30 21.8 E.		5 12.0 E.		10 1.7 E.		15 15.1 E.
	23 18.9 E.		28 8.9 E.	Sept.	2 15.6 E.		8 5.7 E.		12 19.4 E.		18 8.8 E.
	26 12.6 E.	Mar.	3 2.6 E.		5 9.3 E.		10 23.4 E.		15 13.0 E.		21 2.4 E.
	29 6.3 E.		5 20.3 E.		8 3.0 E.		13 17.1 E.		18 6.7 E.		23 20.1 E.
Feb.	1 0.0 E.		8 14.0 E.		10 20.7 E.		16 10.7 E.		21 0.4 E.		26 13.7 E.
	3 17.6 E.		11 7.8 E.		13 14.4 E.		19 4.4 E.		23 18.0 E.		29 7.3 E.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

RHEA.

	d	h		d	h
Jan.	1	9.7 E.	Sept.	25	5.0 E.
	5	22.0 E.		29	17.5 E.
	10	10.3 E.	Oct.	4	5.9 E.
	14	22.7 E.		8	18.4 E.
	19	11.0 E.		13	6.8 E.
	23	23.4 E.		17	19.2 E.
	28	11.8 E.		22	7.6 E.
Feb.	2	0.2 E.		26	20.0 E.
	6	12.6 E.		31	8.4 E.
	11	1.0 E.	Nov.	4	20.7 E.
	15	13.5 E.		9	9.1 E.
	20	1.9 E.		13	21.4 E.
	24	14.4 E.		18	9.7 E.
Mar.	1	2.8 E.		22	22.1 E.
	5	15.3 E.		27	10.4 E.
	10	3.8 E.	Dec.	1	22.7 E.
	14	16.3 E.		6	11.0 E.
	19	4.9 E.		10	23.3 E.
	. . . .			15	11.6 E.
Sept.	11	15.6 E.		19	23.9 E.
	16	4.1 E.		24	12.2 E.
	20	16.6 E.		29	0.5 E.

TITAN.

	d	h		d	h
Jan.	4	12.4 I.	Oct.	7	10.0 W.
	8	8.7 W.		11	10.0 S.
	12	7.0 S.		15	12.0 E.
	16	9.7 E.		19	11.2 I.
	20	10.2 I.		23	8.6 W.
	24	6.5 W.		27	8.5 S.
	28	5.0 S.		31	10.3 E.
Feb.	1	7.8 E.	Nov.	4	9.5 I.
	5	8.5 I.		8	6.7 W.
	9	4.9 W.		12	6.4 S.
	13	3.5 S.		16	8.2 E.
	17	6.4 E.		20	7.3 I.
	21	7.3 I.		24	4.3 W.
	25	3.9 W.		28	3.9 S.
Mar.	1	2.6 S.	Dec.	2	5.6 E.
	5	5.7 E.		6	4.7 I.
	. . . .			10	1.6 W.
Sept.	17	13.2 I.		14	1.1 S.
	21	10.8 W.		18	2.8 E.
	25	11.0 S.		22	1.9 I.
	29	13.1 E.		25	22.8 W.
Oct.	3	12.5 I.		29	22.2 S.

HYPERION.

	d		d
Jan.	2.4 W.	Sept.	6.2 E.
	8.3 S.		11.0 I.
	13.1 E.		17.1 W.
	17.8 I.		22.9 S
	23.6 W.		27.6 E.
	29.6 S.	Oct.	2.4 I.
Feb.	3.4 E.		8.5 W.
	8.1 I.		14.3 S.
	13.9 W.		19.0 E
	19.9 S.		23.8 I.
	24.7 E.		29.8 W.
Mar.	1.4 I.	Nov.	4.6 S.
	7.3 W.		9.2 E.
	13.3 S.		14.0 I.
	18.1 E.		20.0 W.
	22.8 I.		25.8 S.
	28.7 W.		30.4 E
	. . .	Dec.	5.2 I.
Aug.	15.8 E.		11.2 W.
	20.6 I.		16.9 S
	26.6 W.		21.6 E.
Sept.	1.5 S.		26.4 I.

IAPETUS.

	d		d		d		d		d		d
Jan.	5.6 I.	Feb.	12.6 S.	Mar.	26.1 I.	Sept.	24.1 W.	Nov.	2.9 E.	Dec.	11.9 W.
	24.6 W.	Mar.	5.2 E.	Sept.	4.8 I.	Oct.	13.3 S.		23.1 I.		30.7 S.

NINTH SATELLITE OF SATURN.

DIFFERENTIAL COORDINATES OF PHŒBE FOR 1914.

Washington. Mean Noon.		$a_{Ph.} - a_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$	Washington. Mean Noon.		$a_{Ph.} - a_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$	Washington. Mean Noon.		$a_{Ph.} - a_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$
		m s	′ ″			m s	′ ″			m s	′ ″
Jan.	1	+1 14.9	+1 46	Apr.	7	+2 22.8	+6 48	Sept.	30	−0 53.6	+2 12
	5	1 20.9	2 10		11	2 22.2	6 45	Oct.	4	0 59.6	2 7
	9	1 26.6	2 34		15	2 21.3	6 42		8	1 5.5	2 1
	13	1 32.0	2 57		19	2 20.2	6 39		12	1 11.2	1 55
	17	1 37.2	3 19		23	2 18.8	6 35		16	1 16.8	1 48
	21	1 42.2	3 41		27	2 17.2	6 29		20	1 22.3	1 41
	25	1 46.9	4 2	May	1	+2 15.3	+6 22		24	1 27.6	1 33
	29	1 51.3	4 22			. . .	. . .		28	1 32.8	1 24
Feb.	2	1 55.4	4 41	July	28	+0 43.6	+3 26	Nov.	1	1 37.8	1 15
	6	1 59.2	4 58	Aug.	1	0 37.8	3 20		5	1 42.7	1 5
	10	2 2.7	5 14		5	0 31.9	3 14		9	1 47.4	0 55
	14	2 5.9	5 29		9	0 25.9	3 9		13	1 51.9	0 44
	18	2 8.9	5 44		13	0 19.9	3 4		17	1 56.1	0 32
	22	2 11.6	5 57		17	0 13.8	2 59		21	2 0.1	0 19
	26	2 14.0	6 8		21	0 7.7	2 54		25	2 3.9	+0 6
Mar.	2	2 16.1	6 18		25	+0 1.5	2 50		29	2 7.4	−0 8
	6	2 17.9	6 26		29	−0 4.7	2 46	Dec.	3	2 10.7	0 22
	10	2 19.5	6 33	Sept.	2	0 10.8	2 42		7	2 13.7	0 36
	14	2 20.8	6 39		6	0 17.0	2 38		11	2 16.4	0 51
	18	2 21.8	6 44		10	0 23.2	2 34		15	2 18.8	1 6
	22	2 22.5	6 47		14	0 29.4	2 30		19	2 20.9	1 21
	26	2 23.0	6 49		18	0 35.5	2 26		23	2 22.7	1 36
	30	2 23.2	6 50		22	0 41.6	2 22		27	2 24.1	1 50
Apr.	3	+2 23.1	+6 50		26	−0 47.6	+2 17		31	−2 25.2	−2 4

FRACTIONS OF THE PERIODS OF REVOLUTION.

tion of a lution.	Mimas.	Enceladus.		Tethys.		Dione.		Rhea.		Titan.		Fraction of a Revolution.
	h	d	h	d	h	d	h	d	h	d	h	
0.00	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.00
0.02	0.5	0	0.7	0	0.9	0	1.3	0	2.2	0	7.7	0.02
0.04	0.9	0	1.3	0	1.8	0	2.6	0	4.3	0	15.3	0.04
0.06	1.4	0	2.0	0	2.7	0	3.9	0	6.5	0	23.0	0.06
0.08	1.8	0	2.6	0	3.6	0	5.3	0	8.7	1	6.6	0.08
0.10	2.3	0	3.3	0	4.5	0	6.6	0	10.8	1	14.3	0.10
0.12	2.7	0	4.0	0	5.4	0	7.9	0	13.0	1	21.9	0.12
0.14	3.2	0	4.6	0	6.3	0	9.2	0	15.2	2	5.6	0.14
0.16	3.6	0	5.3	0	7.2	0	10.5	0	17.3	2	13.2	0.16
0.18	4.1	0	5.9	0	8.2	0	11.8	0	19.5	2	20.9	0.18
0.20	4.5	0	6.6	0	9.1	0	13.1	0	21.7	3	4.5	0.20
0.22	5.0	0	7.2	0	10.0	0	14.5	0	23.9	3	12.2	0.22
0.24	5.4	0	7.9	0	10.9	0	15.8	1	2.0	3	19.8	0.24
0.26	5.9	0	8.6	0	11.8	0	17.1	1	4.2	4	3.5	0.26
0.28	6.3	0	9.2	0	12.7	0	18.4	1	6.4	4	11.2	0.28
0.30	6.8	0	9.9	0	13.6	0	19.7	1	8.5	4	18.8	0.30
0.32	7.2	0	10.5	0	14.5	0	21.0	1	10.7	5	2.5	0.32
0.34	7.7	0	11.2	0	15.4	0	22.3	1	12.9	5	10.1	0.34
0.36	8.1	0	11.8	0	16.3	0	23.6	1	15.0	5	17.8	0.36
0.38	8.6	0	12.5	0	17.2	1	1.0	1	17.2	6	1.4	0.38
0.40	9.0	0	13.2	0	18.1	1	2.3	1	19.4	6	9.1	0.40
0.42	9.5	0	13.8	0	19.0	1	3.6	1	21.5	6	16.7	0.42
0.44	10.0	0	14.5	0	19.9	1	4.9	1	23.7	7	0.4	0.44
0.46	10.4	0	15.1	0	20.8	1	6.2	2	1.9	7	8.0	0.46
0.48	10.9	0	15.8	0	21.7	1	7.5	2	4.0	7	15.7	0.48
0.50	11.3	0	16.4	0	22.7	1	8.8	2	6.2	7	23.3	0.50
0.52	11.8	0	17.1	0	23.6	1	10.2	2	8.4	8	7.0	0.52
0.54	12.2	0	17.8	1	0.5	1	11.5	2	10.5	8	14.7	0.54
0.56	12.7	0	18.4	1	1.4	1	12.8	2	12.7	8	22.3	0.56
0.58	13.1	0	19.1	1	2.3	1	14.1	2	14.9	9	6.0	0.58
0.60	13.6	0	19.7	1	3.2	1	15.4	2	17.1	9	13.6	0.60
0.62	14.0	0	20.4	1	4.1	1	16.7	2	19.2	9	21.3	0.62
0.64	14.5	0	21.0	1	5.0	1	18.0	2	21.4	10	4.9	0.64
0.66	14.9	0	21.7	1	5.9	1	19.4	2	23.6	10	12.6	0.66
0.68	15.4	0	22.4	1	6.8	1	20.7	3	1.7	10	20.2	0.68
0.70	15.8	0	23.0	1	7.7	1	22.0	3	3.9	11	3.9	0.70
0.72	16.3	0	23.7	1	8.6	1	23.3	3	6.1	11	11.5	0.72
0.74	16.7	1	0.3	1	9.5	2	0.6	3	8.2	11	19.2	0.74
0.76	17.2	1	1.0	1	10.4	2	1.9	3	10.4	12	2.8	0.76
0.78	17.6	1	1.7	1	11.3	2	3.2	3	12.6	12	10.5	0.78
0.80	18.1	1	2.3	1	12.2	2	4.5	3	14.7	12	18.2	0.80
0.82	18.5	1	3.0	1	13.2	2	5.9	3	16.9	13	1.8	0.82
0.84	19.0	1	3.6	1	14.1	2	7.2	3	19.1	13	9.5	0.84
0.86	19.5	1	4.3	1	15.0	2	8.5	3	21.2	13	17.1	0.86
0.88	19.9	1	4.9	1	15.9	2	9.8	3	23.4	14	0.8	0.88
0.90	20.4	1	5.6	1	16.8	2	11.1	4	1.6	14	8.4	0.90
0.92	20.8	1	6.3	1	17.7	2	12.4	4	3.7	14	16.1	0.92
0.94	21.3	1	6.9	1	18.6	2	13.7	4	5.9	14	23.7	0.94
0.96	21.7	1	7.6	1	19.5	2	15.1	4	8.1	15	7.4	0.96
0.98	22.2	1	8.2	1	20.4	2	16.4	4	10.3	15	15.0	0.98
1.00	22.6	1	8.9	1	21.3	2	17.7	4	12.4	15	22.7	1.00

Six Inner Satellites of Saturn.			Hyperion.			Iapetus.		
Fraction of a Revolution.	p^1	F	Time from Eastern Elongation.	p^1	F	Time from Eastern Elongation.	p^1	F
	°		d	°		d	°	
0.00	83.8	1.000	0.0	83.9	0.919	0	78.3	1.0
0.02	80.7	0.994	0.5	79.5	0.909	2	76.3	1.0
0.04	77.4	0.975	1.0	74.8	0.880	4	74.2	0.9
0.06	74.0	0.944	1.5	69.7	0.833	6	72.0	0.9
0.08	70.3	0.902	2.0	64.0	0.772	8	69.4	0.8
0.10	66.2	0.849	2.5	57.1	0.701	10	66.2	0.7
0.12	61.5	0.788	3.0	48.5	0.625	12	62.0	0.6
0.14	55.9	0.721	3.5	37.7	0.552	14	56.1	0.5
0.16	49.2	0.651	4.0	23.9	0.493	16	46.8	0.4
0.18	40.9	0.582	4.5	7.1	0.457	18	29.9	0.3
0.20	30.4	0.519	5.0	348.9	0.456	20	358.9	0.2
0.22	17.4	0.470	5.5	332.0	0.490	22	321.2	0.2
0.24	2.0	0.442	6.0	318.0	0.550	24	297.1	0.3
0.26	345.7	0.442	6.5	307.1	0.625	26	284.2	0.4
0.28	330.3	0.470	7.0	298.6	0.707	28	276.6	0.5
0.30	317.3	0.519	7.5	292.0	0.788	30	271.6	0.6
0.32	306.8	0.582	8.0	286.5	0.864	32	267.9	0.7
0.34	298.5	0.651	8.5	281.8	0.931	34	264.9	0.8
0.36	291.8	0.721	9.0	277.8	0.988	36	262.4	0.93
0.38	286.2	0.788	9.5	274.1	1.032	38	260.0	0.9
0.40	281.5	0.849	10.0	270.7	1.062	40	257.8	0.9
0.42	277.4	0.902	10.5	267.4	1.078	42	255.6	0.95
0.44	273.7	0.944	11.0	264.2	1.078	44	253.2	0.9
0.46	270.3	0.975	11.5	261.0	1.064	46	250.6	0.8
0.48	267.0	0.994	12.0	257.6	1.034	48	247.4	0.7
0.50	263.8	1.000	12.5	253.9	0.989	50	243.3	0.66
0.52	260.7	0.994	13.0	249.9	0.930	52	237.6	0.5
0.54	257.4	0.975	13.5	245.2	0.860	54	228.6	0.4
0.56	254.0	0.944	14.0	239.6	0.779	56	212.7	0.31
0.58	250.3	0.902	14.5	232.7	0.692	58	183.3	0.23
0.60	246.2	0.849	15.0	223.7	0.603	60	145.2	0.2
0.62	241.5	0.788	15.5	211.8	0.521	62	119.6	0.33
0.64	235.9	0.721	16.0	196.0	0.458	64	106.0	0.45
0.66	229.2	0.651	16.5	176.6	0.428	66	98.1	0.5
0.68	220.9	0.582	17.0	156.5	0.441	68	93.0	0.6
0.70	210.4	0.519	17.5	139.0	0.491	70	89.2	0.79
0.72	197.4	0.470	18.0	125.4	0.565	72	86.2	0.8
0.74	182.0	0.442	18.5	115.2	0.647	74	83.8	0.95
0.76	165.7	0.442	19.0	107.3	0.728	76	81.6	0.99
0.78	150.3	0.470	19.5	100.9	0.800	78	79.6	1.0
0.80	137.3	0.519	20.0	95.4	0.857	80	77.6	1.0
0.82	126.8	0.582	20.5	90.6	0.897			
0.84	118.5	0.651	21.0	86.1	0.917			
0.86	111.8	0.721	21.5	81.6	0.917			
0.88	106.2	0.788						
0.90	101.5	0.849						
0.92	97.4	0.902						
0.94	93.7	0.944						
0.96	90.3	0.975						
0.98	87.0	0.994						
1.00	83.8	1.000						

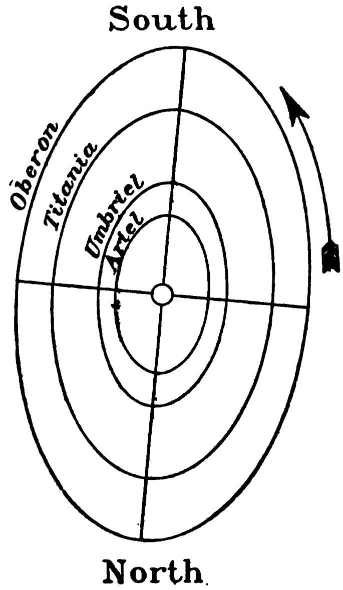
The fraction of a revolution is reckoned from the Eastern Elongation.
Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$

Date.	**Mimas.**		**Enceladus.**		**Tethys.**		**Dione.**	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	°	″	°	″	°	″	°	″
Jan. 0	+0.8	31.4	+1.8	40.4	+1.0	49.9	+1.9	64.0
10	1.2	31.1	1.9	39.9	1.0	49.4	1.9	63.3
20	1.5	30.7	1.9	39.4	1.0	48.7	2.0	62.4
30	1.8	30.2	2.0	38.8	1.1	48.0	2.0	61.5
Feb. 9	2.1	29.7	2.0	38.1	1.1	47.1	2.0	60.4
19	+2.4	29.1	+2.0	37.4	+1.0	46.3	+2.0	59.3
Mar. 1	2.7	28.6	2.0	36.7	1.0	45.4	2.0	58.2
11	2.9	28.1	1.9	36.0	0.9	44.6	2.0	57.2
21	+3.1	27.6	+1.8	35.4	+0.8	43.8	+2.0	56.2
Aug. 28	−1.3	27.2	0.0	34.9	−1.1	43.2	0.0	55.3
Sept. 7	1.5	27.6	−0.1	35.5	1.1	43.9	0.0	56.3
17	1.7	28.1	0.1	36.1	1.1	44.7	0.0	57.3
27	−1.8	28.6	−0.1	36.8	−1.1	45.5	−0.1	58.3
Oct. 7	1.9	29.2	0.1	37.5	1.1	46.3	0.1	59.4
17	1.9	29.7	0.1	38.2	1.1	47.2	0.1	60.5
27	1.8	30.2	0.1	38.8	1.1	48.0	0.1	61.5
Nov. 6	1.7	30.7	0.1	39.4	1.0	48.8	−0.1	62.5
16	−1.5	31.1	−0.1	40.0	−1.0	49.4	0.0	63.4
26	1.2	31.5	0.0	40.4	0.9	50.0	0.0	64.1
Dec. 6	0.9	31.7	0.0	40.7	0.8	50.4	+0.1	64.6
16	0.6	31.8	+0.1	40.9	0.7	50.6	0.1	64.8
26	−0.3	31.8	+0.2	40.9	−0.7	50.6	+0.2	64.8

Date.	**Rhea.**		**Titan.**		**Hyperion.**		**Iapetus.**	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	°	″	°	″	°	″	°	″
Jan. 0	+2.2	89.4	+1.9	207	+1.6	251	−2.3	603
10	2.2	88.4	2.0	205	1.6	248	2.3	597
20	2.3	87.2	2.0	202	1.7	245	2.4	589
30	2.3	85.8	2.1	199	1.7	241	2.4	580
Feb. 9	2.4	84.4	2.1	196	1.8	237	2.4	570
19	+2.4	82.8	+2.1	192	+1.7	232	−2.4	559
Mar. 1	2.3	81.3	2.0	188	1.7	228	2.4	549
11	2.3	79.8	2.0	185	1.7	224	2.4	539
21	+2.2	78.4	+1.9	182	+1.6	220	−2.3	530
Aug. 28	+0.4	77.3	+0.2	179	−0.1	217	+0.3	522
Sept. 7	0.3	78.6	0.2	182	0.2	220	0.4	530
17	0.3	80.0	0.2	185	0.2	224	0.5	540
27	+0.3	81.4	+0.1	189	−0.3	229	+0.6	550
Oct. 7	0.2	82.9	0.1	192	0.3	233	0.6	560
17	0.2	84.5	0.1	196	0.3	237	0.6	570
27	0.3	85.9	0.1	199	0.3	241	0.6	580
Nov. 6	0.3	87.3	0.1	202	0.2	245	0.6	590
16	+0.3	88.5	+0.2	205	−0.2	248	+0.5	598
26	0.4	89.5	0.2	207	0.2	251	0.3	604
Dec. 6	0.4	90.2	0.3	209	−0.1	253	0.2	609
16	0.5	90.5	0.3	210	0.0	254	+0.1	611
26	+0.6	90.5	+0.4	210	0.0	254	−0.1	611

APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF OPPOSITION, AUGUST 2, 1914, AS SEEN IN AN INVERTING TELESCOPE.



Apparent Apsides.

Date.	Position Angle.	App. Distances Ariel.	App. Distances Umbriel.
	°	"	"
May 9,	353.8	13.4	18.7
July 28,	354.6	14.0	19.5
Oct. 16,	355.6	13.5	18.8

Apparent Apsides.

Date.	Position Angle.	App. Distances Titania.	App. Distances Oberon.
	°	"	"
May 9,	353.8	30.6	41.0
July 28,	354.6	32.0	42.8
Oct. 16,	355.6	30.8	41.2

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
Apr. 30 16.9	May 4 11.6	May 1 15.7	May 3 17.4	Apr. 28 16.6	May 3 1.1	May 14 3.9 S.
May 8 6.3	12 1.0	9 22.6	12 0.3	May 7 9.6	11 18.0	20 21.4 N.
15 19.8	19 14.5	18 5.5	20 7.2	16 2.5	20 11.0	27 15.0 S.
23 9.2	27 3.9	26 12.4	28 14.1	24 19.4	29 3.9	June 3 8.6 N.
30 22.7	June 3 17.4	June 3 19.3	June 5 21.0	June 2 12.4	June 6 20.8	10 2.1 S.
June 7 12.1	11 6.8	12 2.2	14 4.0	11 5.3	15 13.8	16 19.7 N.
15 1.6	18 20.3	20 9.1	22 10.9	19 22.2	24 6.7	23 13.3 S.
22 15.0	26 9.8	28 16.1	30 17.8	28 15.2	July 2 23.7	30 6.9 N.
30 4.5	July 3 23.2	July 6 23.0	July 9 0.7	July 7 8.2	11 16.7	July 7 0.5 S.
July 7 18.0	11 12.7	15 5.9	17 7.6	16 1.2	20 9.6	13 18.1 N.
15 7.4	19 2.2	23 12.8	25 14.6	24 18.1	29 2.6	20 11.7 S.
22 20.9	26 15.7	31 19.8	Aug. 2 21.5	Aug. 2 11.1	Aug. 6 19.6	27 5.3 N.
30 10.4	Aug. 3 5.1	Aug. 9 2.7	11 4.5	11 4.1	15 12.6	Aug. 2 22.9 S.
Aug. 6 23.9	10 18.6	17 9.7	19 11.4	19 21.1	24 5.6	9 16.5 N.
14 13.4	18 8.1	25 16.6	27 18.4	28 14.1	Sept. 1 22.6	16 10.2 S.
22 2.8	25 21.6	Sept. 2 23.6	Sept. 5 1.3	Sept. 6 7.1	10 15.6	23 3.8 N.
29 16.3	Sept. 2 11.1	11 6.5	13 8.2	15 0.1	19 8.6	29 21.4 S.
Sept. 6 5.8	10 0.5	19 13.5	21 15.2	23 17.0	28 1.5	Sept. 5 15.0 N.
13 19.3	17 14.0	27 20.4	29 22.1	Oct. 2 10.0	Oct. 6 18.5	12 8.6 S.
21 8.8	25 3.5	Oct. 6 3.3	Oct. 8 5.1	11 3.0	15 11.5	19 2.2 N.
28 22.3	Oct. 2 17.0	14 10.3	16 12.0	19 20.0	24 4.4	25 19.8 S.
Oct. 6 11.8	10 6.5	22 17.2	24 19.0	28 12.9	Nov. 1 21.4	Oct. 2 13.4 N.
14 1.2	17 20.0	31 0.2	Nov. 2 1.9	Nov. 6 5.8	10 14.3	9 7.0 S.
21 14.7	25 9.4	Nov. 8 7.1	10 8.9	14 22.8	19 7.3	16 0.5 N.
29 4.2	Nov. 1 22.9	16 14.0	18 15.9	23 15.7	28 0.2	22 18.1 S.

For Ariel every third elongation is given, and for Umbriel every alternate one; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal Period of Ariel, $2^d\ 12^h.489$; of Umbriel, $4^d\ 3^h.460$; of Titania, $8^d\ 16^h.942$; of Oberon, $13^d\ 11^h.119$.

Fractions of the Period of Revolution.					Fraction of a Revolution.	p^1	F
Fraction of a Revolution.	Ariel.	Umbriel.	Titania.	Oberon.			
	d h	d h	d h	d h		°	
0.00	0 0.0	0 0.0	0 0.0	0 0.0	0.00	354.7	1.000
0.02	0 1.2	0 2.0	0 4.2	0 6.5	0.02	359.0	0.995
0.04	0 2.4	0 4.0	0 8.4	0 12.9	0.04	3.3	0.980
0.06	0 3.6	0 6.0	0 12.5	0 19.4	0.06	7.9	0.955
0.08	0 4.8	0 8.0	0 16.7	1 1.8	0.08	12.7	0.921
0.10	0 6.0	0 10.0	0 20.9	1 8.3	0.10	17.9	0.880
0.12	0 7.3	0 11.9	1 1.1	1 14.8	0.12	23.7	0.834
0.14	0 8.5	0 13.9	1 5.3	1 21.2	0.14	30.2	0.783
0.16	0 9.7	0 15.9	1 9.4	2 3.7	0.16	37.7	0.732
0.18	0 10.9	0 17.9	1 13.6	2 10.2	0.18	46.2	0.683
0.20	0 12.1	0 19.9	1 17.8	2 16.6	0.20	55.9	0.641
0.22	0 13.3	0 21.9	1 22.0	2 23.1	0.22	66.8	0.610
0.24	0 14.5	0 23.9	2 2.1	3 5.5	0.24	78.6	0.593
0.26	0 15.7	1 1.9	2 6.3	3 12.0	0.26	90.8	0.593
0.28	0 16.9	1 3.8	2 10.5	3 18.5	0.28	102.6	0.610
0.30	0 18.1	1 5.8	2 14.7	4 0.9	0.30	113.5	0.641
0.32	0 19.4	1 7.8	2 18.9	4 7.4	0.32	123.2	0.683
0.34	0 20.6	1 9.8	2 23.0	4 13.9	0.34	131.8	0.732
0.36	0 21.8	1 11.8	3 3.2	4 20.3	0.36	139.2	0.783
0.38	0 23.0	1 13.8	3 7.4	5 2.8	0.38	145.7	0.834
0.40	1 0.2	1 15.8	3 11.6	5 9.2	0.40	151.5	0.880
0.42	1 1.4	1 17.8	3 15.8	5 15.7	0.42	156.7	0.921
0.44	1 2.6	1 19.8	3 19.9	5 22.2	0.44	161.5	0.955
0.46	1 3.8	1 21.8	4 0.1	6 4.6	0.46	166.1	0.980
0.48	1 5.0	1 23.7	4 4.3	6 11.1	0.48	170.4	0.995
0.50	1 6.2	2 1.7	4 8.5	6 17.6	0.50	174.7	1.000
0.52	1 7.5	2 3.7	4 12.6	7 0.0	0.52	179.0	0.995
0.54	1 8.7	2 5.7	4 16.8	7 6.5	0.54	183.3	0.980
0.56	1 9.9	2 7.7	4 21.0	7 12.9	0.56	187.9	0.955
0.58	1 11.1	2 9.7	5 1.2	7 19.4	0.58	192.7	0.921
0.60	1 12.3	2 11.7	5 5.4	8 1.9	0.60	197.9	0.880
0.62	1 13.5	2 13.7	5 9.5	8 8.3	0.62	203.7	0.834
0.64	1 14.7	2 15.7	5 13.7	8 14.8	0.64	210.2	0.783
0.66	1 15.9	2 17.6	5 17.9	8 21.3	0.66	217.7	0.732
0.68	1 17.1	2 19.6	5 22.1	9 3.7	0.68	226.2	0.683
0.70	1 18.3	2 21.6	6 2.3	9 10.2	0.70	235.9	0.641
0.72	1 19.6	2 23.6	6 6.4	9 16.6	0.72	246.8	0.610
0.74	1 20.8	3 1.6	6 10.6	9 23.1	0.74	258.6	0.593
0.76	1 22.0	3 3.6	6 14.8	10 5.6	0.76	270.8	0.593
0.78	1 23.2	3 5.6	6 19.0	10 12.0	0.78	282.6	0.610
0.80	2 0.4	3 7.6	6 23.2	10 18.5	0.80	293.5	0.641
0.82	2 1.6	3 9.6	7 3.3	11 1.0	0.82	303.2	0.683
0.84	2 2.8	3 11.5	7 7.5	11 7.4	0.84	311.8	0.732
0.86	2 4.0	3 13.5	7 11.7	11 13.9	0.86	319.2	0.783
0.88	2 5.2	3 15.5	7 15.9	11 20.3	0.88	325.7	0.834
0.90	2 6.4	3 17.5	7 20.0	12 2.8	0.90	331.5	0.880
0.92	2 7.7	3 19.5	8 0.2	12 9.3	0.92	336.7	0.921
0.94	2 8.9	3 21.5	8 4.4	12 15.7	0.94	341.5	0.955
0.96	2 10.1	3 23.5	8 8.6	12 22.2	0.96	346.1	0.980
0.98	2 11.3	4 1.5	8 12.8	13 4.7	0.98	350.4	0.995
1.00	2 12.5	4 3.5	8 16.9	13 11.1	1.00	354.7	1.000

The fraction of a revolution is reckoned from the Northern Elongation.
Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$ Ariel.	Umbriel.	Titania.	Oberon.	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$ Ariel.	Umbriel.	Titania.	Ober
	°	″	″	″	″		°	″	″	″	
Apr. 4	−0.6	13.0	18.3	29.8	39.8	Aug. 2	0.0	14.0	19.7	32.0	4
9	0.7	13.0	18.3	29.9	39.9	7	+0.1	14.0	19.7	32.0	4
14	0.7	13.1	18.4	30.0	40.1	12	0.2	13.9	19.6	32.0	4
19	0.8	13.1	18.5	30.1	40.3	17	0.3	13.9	19.6	32.0	4
24	0.8	13.2	18.6	30.2	40.4	22	0.4	13.9	19.6	31.9	4
29	−0.8	13.2	18.6	30.4	40.6	27	+0.4	13.9	19.6	31.9	4
May 4	0.9	13.3	18.7	30.5	40.8	Sept. 1	0.5	13.9	19.5	31.8	4
9	0.9	13.4	18.8	30.6	40.9	6	0.6	13.8	19.5	31.7	4
14	0.9	13.4	18.9	30.8	41.1	11	0.7	13.8	19.4	31.6	4
19	0.9	13.5	19.0	30.9	41.3	16	0.7	13.7	19.4	31.5	4
24	−0.9	13.5	19.0	31.0	41.5	21	+0.8	13.7	19.3	31.4	4
29	0.9	13.6	19.1	31.1	41.6	26	0.8	13.7	19.2	31.3	4
June 3	0.8	13.6	19.2	31.2	41.8	Oct. 1	0.8	13.6	19.2	31.2	4
8	0.8	13.7	19.3	31.3	41.9	6	0.9	13.6	19.1	31.1	4
13	0.8	13.7	19.3	31.5	42.1	11	0.9	13.5	19.0	30.9	4
18	−0.7	13.8	19.4	31.6	42.2	16	+0.9	13.4	18.9	30.8	4
23	0.6	13.8	19.4	31.7	42.3	21	0.9	13.4	18.8	30.7	4
28	0.6	13.8	19.5	31.7	42.4	26	0.9	13.3	18.8	30.5	40
July 3	0.5	13.9	19.5	31.8	42.5	31	0.9	13.3	18.7	30.4	40
8	0.4	13.9	19.6	31.9	42.6	Nov. 5	0.8	13.2	18.6	30.3	40
13	−0.4	13.9	19.6	31.9	42.7	10	+0.8	13.2	18.5	30.2	40
18	0.3	13.9	19.6	32.0	42.8	15	0.7	13.1	18.4	30.0	40
23	0.2	14.0	19.7	32.0	42.8	20	0.6	13.0	18.4	29.9	40
28	−0.1	14.0	19.7	32.0	42.8	25	+0.6	13.0	18.3	29.8	39

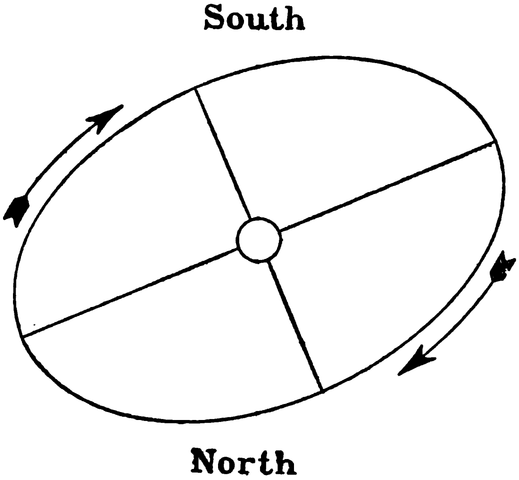
SATELLITE OF NEPTUNE, 1914.

Time from Eastern Elongation.	p^1	F	Time from Eastern Elongation.	p^1	F	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$
d h	°		d h	°			°	″		°	
0 0	112.6	1.000	3 0	290.2	0.999	Jan. 0	+0.6	16.8	Apr. 30	−1.6	16
0 3	107.6	0.995	3 3	285.2	0.989	5	0.4	16.9	May 5	1.5	16
0 6	102.6	0.980	3 6	280.0	0.969	10	0.2	16.9	10	1.4	16
0 9	97.3	0.955	3 9	274.5	0.940	15	+0.1	16.9	15	−1.3	16
0 12	91.6	0.922	3 12	268.7	0.903	20	−0.1	16.9	Sept. 27	+3.8	16
0 15	85.5	0.882	3 15	262.3	0.860	25	−0.3	16.9	Oct. 2	+3.9	16
0 18	78.8	0.837	3 18	255.2	0.814	30	0.4	16.8	7	3.9	16
0 21	71.3	0.791	3 21	247.2	0.768	Feb. 4	0.6	16.8	12	4.0	16
1 0	62.8	0.745	4 0	238.3	0.724	9	0.8	16.8	17	4.1	16
1 3	53.3	0.704	4 3	228.3	0.688	14	0.9	16.8	22	4.1	16
1 6	42.8	0.673	4 6	217.3	0.662	19	−1.1	16.8	27	+4.2	16
1 9	31.5	0.654	4 9	205.7	0.650	24	1.2	16.7	Nov. 1	4.2	16.
1 12	19.7	0.650	4 12	194.0	0.654	Mar. 1	1.3	16.7	6	4.2	16.
1 15	8.1	0.661	4 15	182.6	0.672	6	1.4	16.7	11	4.2	16.
1 18	357.1	0.687	4 18	172.1	0.704	11	1.5	16.6	16	4.1	16.
1 21	347.1	0.724	4 21	162.6	0.744	16	−1.6	16.6	21	+4.1	16.
2 0	338.2	0.767	5 0	154.1	0.790	21	1.7	16.6	26	4.0	16.
2 3	330.2	0.814	5 3	146.6	0.837	26	1.7	16.5	Dec. 1	3.9	16.
2 6	323.1	0.860	5 6	139.9	0.881	31	1.7	16.5	6	3.8	16.
2 9	316.7	0.902	5 9	133.8	0.921	Apr. 5	1.7	16.4	11	3.7	16.
2 12	310.8	0.939	5 12	128.1	0.955	10	−1.7	16.4	16	+3.6	16.
2 15	305.4	0.968	5 15	122.8	0.979	15	1.7	16.3	21	3.5	16.
2 18	300.2	0.988	5 18	117.7	0.995	20	1.7	16.3	26	3.3	16.
2 21	295.2	0.999	5 21	112.7	1.000	25	−1.6	16.2	31	+3.2	16.

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION, JANUARY 17, 1914, AS SEEN IN AN INVERTING TELESCOPE.



Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
	°	″
Feb. 26	111.4	16.7
May 17	111.4	16.0
Oct. 4	116.5	16.1
Dec. 23	116.0	16.7

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

East.		West.		East.		West.		East.		West.	
	d h		d h		d h		d h		d h		d h
	.....	Jan.	1 21.5	Mar.	22 6.7	Mar.	25 5.2	Oct.	13 20.9	Oct.	16 19.4
Jan.	4 20.1		7 18.7		28 3.7		31 2.3		19 17.9		22 16.4
	10 17.2		13 15.8	Apr.	3 0.8	Apr.	5 23.3		25 14.9		28 13.4
	16 14.4		19 12.9		8 21.9		11 20.4		31 11.9	Nov.	3 10.4
	22 11.5		25 10.1		14 18.9		17 17.4	Nov.	6 8.9		9 7.4
	28 8.6		31 7.2		20 16.0		23 14.5		12 6.0		15 4.5
Feb.	3 5.8	Feb.	6 4.3		26 13.0		29 11.5		18 3.0		21 1.6
	9 2.9		12 1.5	May	2 10.0	May	5 8.5		24 0.1		26 22.6
	15 0.0		17 22.6		8 7.0		11 5.5		29 21.2	Dec.	2 19.7
	20 21.2		23 19.7		14 4.0		17 2.5	Dec.	5 18.2		8 16.8
	26 18.3	Mar.	1 16.8		.....		.....		11 15.3		14 13.9
Mar.	4 15.4		7 13.9	Sept.	26 5.9	Sept.	29 4.4		17 12.4		20 11.0
	10 12.5		13 11.0	Oct.	2 2.9	Oct.	5 1.4		23 9.5		26 8.1
	16 9.6		19 8.1		7 23.9		10 22.4		29 6.6		32 5.2

The above times are the instants of each passage of the satellite through the apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, bearing in mind that the radius vector of the satellite describes equal areas in equal times.

The sidereal period of the satellite of Neptune is $5^d\ 21^h.044$.

NOTE.—In the preceding diagrams the central circle represents the planet and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m			°	′
Jan.	3	3	–	⊕	in Perihelion.		
	5	1	–	☍ ♂ ☉			
	8	0	–	☿	in Aphelion.		
	8	16	32	☌ ♄ ☾	♄ −	6	47
	10	20	40	☌ ♂ ☾	♂ −	0	34
	11	20	30	☌ ♆ ☾	♆ −	4	27
	13	12	–	☌ ☿ ♀	☿ −	1	4
	17	1	–	☍ ♆ ☉			
	19	23	–	☌ ♃ ☉			
	21	21	–	☌ ☿ ♃	☿ −	1	40
	24	15	–	☌ ☿ ☉	Superior.		
	25	1	–	☌ ♀ ♃	♀ −	0	33
	25	3	34	☌ ♃ ☾	♃ +	3	22
	25	3	46	☌ ♀ ☾	♀ +	2	48
	25	14	7	☌ ☿ ☾	☿ +	1	14
	25	15	52	☌ ♅ ☾	♅ +	2	44
	26	3	–	☌ ☿ ♅	☿ −	1	32
	27	15	–	☌ ♅ ☉			
	28	9	–	☿	Greatest Hel. Lat. S.		
	30	11	–	☌ ♀ ♅	♀ −	0	30
Feb.	3	14	–	♀	in Aphelion.		
	5	0	23	☌ ♄ ☾	♄ −	6	50
	6	19	30	☌ ♂ ☾	♂ −	1	9
	8	5	30	☌ ♆ ☾	♆ −	4	31
	11	3	–	☌ ♀ ☉	Superior.		
	11	10	–	♄	Stationary.		
	12	8	–	♂	Stationary.		
	16	9	–	☿	in ☊		
	21	0	–	☿	in Perihelion.		
	21	22	22	☌ ♃ ☾	♃ +	2	56
	22	1	–	☿	Great. elong. E.	18	8
	22	1	32	☌ ♅ ☾	♅ +	2	39
	24	–	–	☉	Ann. ecl. invis. at W.		
	24	14	53	☌ ♀ ☾	♀ −	1	1
	25	18	52	☌ ☿ ☾	☿ +	1	36
	26	1	–	♀	Greatest Hel. Lat. S.		
	28	3	–	☿	Stationary.		
Mar.	2	6	–	□ ♄ ☉			
	3	6	–	☿	Greatest Hel. Lat. N.		
	3	16	–	☌ ♃ ♅	♃ +	0	9
	4	9	31	☌ ♄ ☾	♄ −	6	47
	5	20	–	☌ ☿ ♀	☿ +	5	28
	6	9	36	☌ ♂ ☾	♂ −	1	49
	7	14	58	☌ ♆ ☾	♆ −	4	35
	9	22	–	☌ ☿ ☉	Inferior.		
	11	–	–	☾	Par. ecl. vis. at W.		
	20	18	3	☉	enters ♈, Spring com.		
	21	9	50	☌ ♅ ☾	♅ +	2	32
	21	15	31	☌ ♃ ☾	♃ +	2	26
	21	21	–	♂	Greatest Hel. Lat. N.		
	22	8	–	☿	Stationary.		
	23	23	7	☌ ☿ ☾	☿ +	1	8
Mar.	26	18	–	☿	in ☋		
	27	4	46	☌ ♀ ☾	♀ −	4	16
	31	19	22	☌ ♄ ☾	♄ −	6	37
Apr.	3	9	58	☌ ♂ ☾	♂ −	2	0
	3	23	19	☌ ♆ ☾	♆ −	4	30
	5	18	–	♆	Stationary.		
	5	23	–	☿	in Aphelion.		
	6	13	–	☿	Great. elong. W.	27	46
	10	11	–	□ ♂ ☉			
	15	14	–	□ ♆ ☉			
	17	17	42	☌ ♅ ☾	♅ +	2	20
	18	7	5	☌ ♃ ☾	♃ +	1	50
	20	18	–	☌ ♂ ♆	♂ +	2	34
	22	21	24	☌ ☿ ☾	☿ −	5	30
	23	8	–	♀	in ☊		
	26	8	–	☿	Greatest Hel. Lat. S.		
	26	13	–	♂	in Aphelion.		
	26	13	12	☌ ♀ ☾	♀ −	4	52
	28	6	3	☌ ♄ ☾	♄ −	6	22
May	1	6	16	☌ ♆ ☾	♆ −	4	17
	1	15	34	☌ ♂ ☾	♂ −	1	36
	2	2	–	□ ♅ ☉			
	11	19	–	□ ♃ ☉			
	15	1	56	☌ ♅ ☾	♅ +	2	3
	15	8	–	☿	in ☊		
	15	20	42	☌ ♃ ☾	♃ +	1	13
	15	21	–	☌ ♀ ♄	♀ +	2	10
	16	15	–	♅	Stationary.		
	16	17	–	☌ ☿ ☉	Superior.		
	19	23	–	☿	in Perihelion.		
	25	7	59	☌ ☿ ☾	☿ −	3	27
	25	17	57	☌ ♄ ☾	♄ −	6	9
	26	15	54	☌ ♀ ☾	♀ −	3	21
	26	23	–	♀	in Perihelion.		
	28	3	–	☌ ☿ ♄	☿ +	3	2
	28	12	48	☌ ♆ ☾	♆ −	4	1
	30	0	8	☌ ♂ ☾	♂ −	0	42
	30	6	–	☿	Greatest Hel. Lat. N.		
June	11	3	–	♃	Stationary.		
	11	10	25	☌ ♅ ☾	♅ +	1	48
	12	7	24	☌ ♃ ☾	♃ +	0	43
	12	21	–	☌ ♄ ☉			
	16	9	–	☌ ♀ ♆	♀ +	2	14
	17	20	–	♀	Greatest Hel. Lat. N.		
	18	14	–	☿	Great. elong. E.	24	52
	21	13	47	☉	enters ♋, Summer com.		
	22	7	16	☌ ♄ ☾	♄ −	6	1
	22	17	–	☿	in ☋		
	24	20	2	☌ ☿ ☾	☿ −	3	55
	24	20	21	☌ ♆ ☾	♆ −	3	49
	25	5	–	☌ ☿ ♆	☿ −	0	10
	25	16	0	☌ ♀ ☾	♀ −	0	46

WASHINGTON MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m			°	′
June	27	10	50	☌ ♂ ☾	♂ +	0	36
July	1	21	–	☿	Stationary.		
	2	7	–	⊕	in Aphelion.		
	2	23	–	☿	in Aphelion.		
	7	17	–	☌ ☿ ♆	☿ —	3	21
	8	18	19	☌ ♅ ☾	♅ +	1	42
	9	14	6	☌ ♃ ☾	♃ +	0	32
	16	1	–	☌ ☿ ☉	Inferior.		
	19	21	35	☌ ♄ ☾	♄ —	5	59
	20	21	–	☌ ♆ ☉			
	21	14	38	☌ ☿ ☾	☿ —	8	37
	22	5	42	☌ ♆ ☾	♆ —	3	43
	23	7	–	☿	Greatest Hel. Lat. S.		
	25	13	16	☌ ♀ ☾	♀ +	1	52
	25	23	24	☌ ♂ ☾	♂ +	2	7
	26	12	–	☿	Stationary.		
Aug.	2	2	–	☍ ♅ ☉			
	4	20	–	☿	Great. elong. W.	19	14
	5	0	49	☌ ♅ ☾	♅ +	1	45
	5	9	–	☌ ♀ ♂	♀ —	0	10
	5	16	50	☌ ♃ ☾	♃ +	0	40
	10	4	–	☍ ♃ ☉			
	11	8	–	☿	in ☊		
	12	21	–	♀	in ☋		
	15	22	–	☿	in Perihelion.		
	16	11	50	☌ ♄ ☾	♄ —	5	58
	18	16	36	☌ ♆ ☾	♆ —	3	41
	20	–	–	☉	Tot. ec. Par. at W.		
	20	0	32	☌ ☿ ☾	☿ —	0	20
	23	13	38	☌ ♂ ☾	♂ +	3	32
	24	4	40	☌ ♀ ☾	♀ +	2	48
	26	5	–	☿	Greatest Hel. Lat. N.		
	30	1	–	☌ ☿ ☉	Superior.		
Sept.	1	5	47	☌ ♅ ☾	♅ +	1	52
	1	17	31	☌ ♃ ☾	♃ +	0	58
	3	–	–	☾	Par. ec. invis. at Wash.		
	13	0	24	☌ ♄ ☾	♄ —	5	54
	15	3	51	☌ ♆ ☾	♆ —	3	37
	16	7	–	♀	in Aphelion.		
	17	19	–	♀	Great. elong. E.	46	27
	18	16	–	☿	in ☋		
	20	10	59	☌ ☿ ☾	☿ +	3	23
	21	5	19	☌ ♂ ☾	♂ +	4	32
	22	12	37	☌ ♀ ☾	♀ +	1	30
	23	4	26	☉	enters ♎, Autumn com.		
	25	5	–	□ ♄ ☉			
	28	10	11	☌ ♅ ☾	♅ +	1	53
	28	19	30	☌ ♃ ☾	♃ +	1	6
	28	22	–	☿	in Aphelion.		
Oct.	5	12	–	♂	in ☋		
	5	15	–	☌ ☿ ♂	☿ —	2	11
	8	17	–	♀	Greatest Hel. Lat. S.		
Oct.	8	20	–	♃	Stationary.		
	10	9	38	☌ ♄ ☾	♄ —	5	45
	12	13	43	☌ ♆ ☾	♆ —	3	27
	14	19	–	♄	Stationary.		
	14	23	–	☿	Great. elong. E.	24	52
	17	19	–	♅	Stationary.		
	19	7	–	☿	Greatest Hel. Lat. S.		
	19	22	22	☌ ♂ ☾	♂ +	4	55
	20	6	29	☌ ☿ ☾	☿ +	1	55
	21	8	54	☌ ♀ ☾	♀ —	0	24
	22	19	–	♀	Greatest brilliancy.		
	24	0	–	□ ♆ ☉			
	25	15	54	☌ ♅ ☾	♅ +	1	43
	26	2	0	☌ ♃ ☾	♃ +	0	56
	26	21	–	☿	Stationary.		
	29	23	–	☌ ☿ ♂	☿ —	2	14
	31	8	–	□ ♅ ☉			
Nov.	2	20	–	♆	Stationary.		
	6	–	–	☿	Transit, part. vis. at W.		
	6	8	–	□ ♃ ☉			
	6	14	55	☌ ♄ ☾	♄ —	5	34
	6	16	–	♀	Stationary.		
	6	19	–	☌ ☿ ☉	Inferior.		
	7	7	–	☿	in ☊		
	8	21	2	☌ ♆ ☾	♆ —	3	11
	11	21	–	☿	in Perihelion.		
	15	16	–	☿	Stationary.		
	15	23	8	☌ ☿ ☾	☿ +	7	11
	17	16	49	☌ ♂ ☾	♂ +	4	38
	17	23	4	☌ ♀ ☾	♀ +	1	7
	21	5	–	☌ ♀ ♂	♀ —	2	45
	22	0	35	☌ ♅ ☾	♅ +	1	25
	22	4	–	☿	Great. Hel. Lat. N.		
	22	14	31	☌ ♃ ☾	♃ +	0	28
	23	9	–	☿	Great. elong. W.	19	52
	27	0	–	☌ ♀ ☉	Inferior.		
Dec.	3	17	36	☌ ♄ ☾	♄ —	5	29
	4	0	–	♀	in ☊		
	6	2	11	☌ ♆ ☾	♆ —	2	58
	6	22	–	☌ ☿ ♀	☿ +	0	21
	14	16	42	☌ ♀ ☾	♀ +	7	36
	15	15	–	☿	in ☋		
	15	15	14	☌ ☿ ☾	☿ +	4	56
	16	12	49	☌ ♂ ☾	♂ +	3	47
	16	13	–	♀	Stationary.		
	19	12	17	☌ ♅ ☾	♅ +	1	6
	20	8	24	☌ ♃ ☾	♃ —	0	12
	20	20	–	☍ ♄ ☉			
	21	23	15	☉	enters ♑, Winter com.		
	23	12	–	☌ ♅ ☉			
	25	21	–	☿	in Aphelion.		
	30	20	13	☌ ♄ ☾	♄ —	5	31

OBSERVATORIES, 1914.

Place.	Geographic Latitude.			Reduction to Geocentric Latitude.		Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Washington.		
	°	′	″	′	″			h	m	s
Abbadia, France .	+43	22	52.2	−11	39.2	69	9.999 313	− 5	1	15.7
Adelaide	−34	55	38	+10	56.8	43	9.999 523	+ 9	37	23.9
Albany, N. Y. . .	+42	39	12.7	−11	38.0	67	9.999 331	− 0	13	9.0
Algiers	+36	47	50	−11	11.3	342	9.999 497	− 5	20	24.3
Allegheny, Pa. . .	+40	28	58.0	−11	31.4	384	9.999 409	+ 0	11	49.6
Amherst, Mass. .	+42	21	56.5	−11	37.3	110	9.999 341	− 0	18	9.8
Ann Arbor, Mich. .	+42	16	48.0	−11	37.0	285	9.999 355	+ 0	26	39.4
Appleton, Wis. .	+44	15	39	−11	40.1	238	9.999 301	+ 0	45	20.1
Arcetri, Italy . .	+43	45	14.6	−11	39.7	184	9.999 310	− 5	53	17.1
Arequipa, Peru .	−16	22	28.0	+ 6	17.8	2452	0.000 051	− 0	22	4.0
Armagh, Ireland .	+54	21	12.7	−11	4.2	61	9.999 033	− 4	41	40.4
Athens	+37	58	20.7	−11	18.9	107	9.999 452	− 6	43	8.7
Baltimore, Md. .	+39	17	48	−11	25.5	75	9.999 417	− 0	1	49.8
Bamberg, Bavaria.	+49	53	6.0	−11	30.7	300	9.999 161	− 5	51	49.4
Barcelona, Spain .	+41	25	18	−11	34.7	420	9.999 387	− 5	16	43.8
Bayswater . . .	−31	55	13	+10	27.8	30	9.999 593	+11	8	6
Beloit, Wis. . . .	+42	30	8.4	−11	37.6	. . .	9.999 331	+ 0	47	51.5
Bergen, Norway .	+60	23	54	−10	2.7	. . .	9.998 888	− 5	29	28.5
Berkeley, Cal. . .	+37	52	23.6	−11	18.3	97	9.999 455	+ 3	0	46.9
Berlin, Prussia . .	+52	30	16.7	−11	17.1	47	9.999 078	− 6	1	50.6
Berlin, Prussia . .	+52	31	30.7	−11	17.0	. . .	9.999 075	− 6	1	43.2
Berlin, Prussia . .	+52	29	7	−11	17.3	38	9.999 078	− 6	2	10.0
Berne, Switzerland	+46	57	8.7	−11	39.0	573	9.999 255	− 5	38	1.5
Besançon, France .	+47	14	59.0	−11	38.5	310	9.999 229	− 5	32	12.9
Bethlehem, Pa. .	+40	36	23.1	−11	31.9	. . .	9.999 379	− 0	6	43.9
Birr Castle, Ireland	+53	5	47.0	−11	13.3	56	9.999 064	− 4	36	34.9
Bloomington, Ind.	+39	9	54	−11	25.5	266	9.999 433	+ 0	38	38
Bogota	+ 4	36	15.4	−11	51.5	2634	0.000 170	− 0	11	21.5
Bombay, India .	+18	53	45	− 7	8.1	19	9.999 848	− 9	59	31.5
Bonn, Prussia . .	+50	43	45.0	−11	26.9	62	9.999 124	− 5	36	39.0
Bordeaux, France	+44	50	7.2	−11	40.4	73	9.999 276	− 5	6	10.2
Boston, Mass. . .	+42	20	58	−11	37.2	. . .	9.999 334	− 0	23	56.7
Bothkamp, Prussia	+54	12	9.6	−11	5.3	32	9.999 035	− 5	48	47.0
Bremen, Germany	+53	4	36	−11	13.4	. . .	9.999 061	− 5	43	31.7
Breslau, Prussia .	+51	6	55.8	−11	25.0	147	9.999 120	− 6	16	24.5
Brisbane	−27	28	0	+ 9	32.2	. . .	9.999 689	+ 8	39	37.8
Brussels, Belgium.	+50	47	55.5	−11	26.6	100	9.999 125	− 5	25	42.7
Budapest, Hungary	+47	29	34.7	−11	38.0	. . .	9.999 202	− 6	24	31.1
Cambridge, Eng. .	+52	12	51.6	−11	18.9	26	9.999 084	− 5	8	38.5
Cambridge, Mass. .	+42	22	47.6	−11	37.3	24	9.999 336	− 0	23	44.7
Cape of Good Hope	−33	56	3.6	+10	48.0	16	9.999 544	− 6	22	10.5
Carloforte . . .	+39	8	9	−11	25.3	18	9.999 417	− 5	41	30.7
Catania, Sicily . .	+37	30	13.3	−11	16.0	47	9.999 460	− 6	8	36
Charkow, Russia .	+50	0	9.6	−11	30.2	138	9.999 147	− 7	33	11.5
Charlottesville, Va.	+38	2	1.2	−11	19.3	250	9.999 461	+ 0	5	49.4

No.	Longitude from Greenwich.		Reduction from Gr. Sid. Time of Mean Noon to Local S. T. M. N.	Description.
	In Time.	In Arc.		
	h m s	° ′ ″	s	
1	+ 0 7 0.1	+ 1 45 1.5	+ 1.15	Obs. Paris Academy of Science, Hendaye.
2	− 9 14 20.30	−138 35 4.5	− 91.06	South Australia.
3	+ 4 55 6.8	+ 73 46 42.0	+ 48.48	Dudley Obs. Old Obs. 36″.8 N., $6^{s}.79$ E.
4	− 0 12 8.55	− 3 2 8.2	− 2.00	At Bouzaréah, near Algiers. Old Obs. 3′.8 S., 8^{s}E.
5	+ 5 20 5.39	+ 80 1 20.8	+ 52.58	Univ. of Pittsburgh. Old Obs., 76″.4 S., $2^{s}.46$ E.
6	+ 4 50 5.93	+ 72 31 29.0	+ 47.66	Amherst College Obs. Old Obs. 20″.6 N., $1^{s}.26$ E.
7	+ 5 34 55.19	+ 83 43 47.8	+ 55.02	Detroit Obs. of the University of Michigan.
8	+ 5 53 35.89	+ 88 23 58.4	+ 58.09	Underwood Obs. of the Lawrence University.
9	− 0 45 1.34	− 11 15 20.1	− 7.40	Near Florence.
10	+ 4 46 11.73	+ 71 32 56.0	+ 47.02	Branch of the Harvard College Observatory.
11	+ 0 26 35.4	+ 6 38 51.0	+ 4.37	University Observatory.
12	− 1 34 52.92	− 23 43 13.8	− 15.59	National Observatory of Greece.
13	+ 5 6 26.0	+ 76 36 30	+ 50.34	Johns Hopkins University Observatory.
14	− 0 43 33.65	− 10 53 24.8	− 7.16	Remeis Observatory.
15	− 0 8 28.0	− 2 7 0	− 1.39	Fabra Obs. of the Royal Acad. of Sci. and Arts.
16	− 7 43 38	−115 54 30	− 76.16	International Latitude Obs. West Australia.
17	+ 5 56 7.3	+ 89 1 49.5	+ 58.50	Smith Observatory of Beloit College.
18	− 0 21 12.75	− 5 18 11.2	− 3.48	Observatory of Naval School.
19	+ 8 9 2.72	+122 15 40.8	+ 80.34	Student's Obs. of the University of California.
20	− 0 53 34.85	− 13 23 42.8	− 8.80	Royal Obs. Old Obs. 56″.4 N., $0^{s}.39$ W.
21	− 0 53 27.45	− 13 21 51.8	− 8.78	Urania Observatory.
22	− 0 53 54.2	− 13 28 33	− 8.86	Treptow Observatory.
23	− 0 29 45.73	− 7 26 26.0	− 4.89	Observatory of the Cantonal University.
24	− 0 23 57.17	− 5 59 17.6	− 3.94	National Observatory.
25	+ 5 1 31.85	+ 75 22 57.8	+ 49.53	Sayre Obs. of Lehigh Univ. at South Bethlehem.
26	+ 0 31 40.9	+ 7 55 13.5	+ 5.20	Private observatory of the Earl of Rosse.
27	+ 5 46 54	+ 86 43 30	+ 56.99	Kirkwood Obs. of the University of Indiana.
28	+ 4 56 54.20	+ 74 13 33.0	+ 48.77	National Obs. of the Republic of Colombia.
29	− 4 51 15.74	− 72 48 56.1	− 47.85	Government Obs. Colaba.
30	− 0 28 23.22	− 7 5 48.3	− 4.66	Royal University Observatory.
31	+ 0 2 5.54	+ 0 31 23.1	+ 0.34	Observatory, Univ. of Bordeaux at Floirac.
32	+ 4 44 19.1	+ 71 4 46.5	+ 46.71	Obs. of Boston Univ. Old Obs. 34″ N., $4^{s}.1$ E.
33	− 0 40 31.2	− 10 7 48.0	− 6.66	Observatory of Herr. von Bülow.
34	− 0 35 15.9	− 8 48 58.5	− 5.79	Formerly Olber's Observatory.
35	− 1 8 8.79	− 17 2 11.8	− 11.20	Royal University Observatory.
36	−10 12 6.4	−153 1 36	−100.55	Queensland, Australia.
37	− 0 17 26.9	− 4 21 43.5	− 2.87	Royal Obs. of Belgium. Old Obs. 3′18″N., $1^{s}.8$ E.
38	− 1 16 15.3	− 19 3 49.5	− 12.53	University Observatory.
39	− 0 0 22.75	− 0 5 41.2	− 0.06	University of Cambridge Observatory.
40	+ 4 44 31.05	+ 71 7 45.8	+ 46.74	Harvard College Observatory.
41	− 1 13 54.76	− 18 28 41.4	− 12.14	Royal Observatory.
42	− 0 33 14.9	− 8 18 43.5	− 5.46	Internat. Lat. Obs., Sardinia.
43	− 1 0 20	− 15 5 0	− 9.91	Royal Astrophysical Obs. of the University.
44	− 2 24 55.77	− 36 13 56.6	− 23.81	University Observatory.
45	+ 5 14 5.22	+ 78 31 18.3	+ 51.60	Leander McCormick Obs. of Univ. of Virginia.

No.	PLACE.	Geographic Latitude.			Reduction to Geocentric Latitude.		Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Washington.		
		°	′	″	′	″			h	m	s
46	Chicago, Ill.. . .	+41	50	1.0	−11	35.9	. . .	9.999 348	+ 0	42	11.0
47	Christiania, Norway	+59	54	44.0	−10	8.7	25	9.998 901	− 5	51	9.3
48	Cincinnati, Ohio .	+39	8	19.5	−11	25.4	249	9.999 433	+ 0	29	25.6
49	Cleveland, Ohio .	+41	30	14.5	−11	34.9	212	9.999 370	+ 0	18	10.0
50	Clinton, N. Y. . .	+43	3	17.0	−11	38.7	276	9.999 335	− 0	6	38.3
51	Coimbra, Portugal	+40	12	24.5	−11	30.3	99	9.999 396	− 4	34	32.7
52	Columbia, Mo. . .	+38	56	51.7	−11	24.4	225	9.999 436	+ 1	1	2.5
53	Columbus, Ohio .	+39	59	50.4	−11	29.4	. . .	9.999 394	+ 0	23	46.8
54	Copenhagen . . .	+55	41	12.6	−10	53.1	14	9.998 998	− 5	58	34.4
55	Cordoba	−31	25	15.2	+10	22.2	434	9.999 632	− 0	51	27.5
56	Cracow, Austria .	+50	3	52.0	−11	29.9	220	9.999 152	− 6	28	6.0
57	Dantzig	+54	21	18.0	−11	4.1	3	9.999 029	− 6	22	55.4
58	Dehra Dun, India.	+30	18	51.8	−10	9.4	687	9.999 674	−10	20	29.2
59	Denver, Colo. . .	+39	40	36.4	−11	27.9	1650	9.999 514	+ 1	51	31.8
60	Des Moines, Iowa .	+41	36	0	−11	35.2	296	9.999 374	+ 1	6	14.7
61	Dorpat, Russia .	+58	22	47.1	−10	26.4	65	9.998 938	− 6	55	9.0
62	Dresden, Saxony .	+51	2	16.8	−11	25.4	. . .	9.999 112	− 6	3	10.6
63	Dublin, Ireland .	+53	23	13.1	−11	11.3	86	9.999 059	− 4	42	54.7
64	Dun Echt., Scotland	+57	9	36	−10	39.2	141	9.998 972	− 4	58	35.8
65	Durham, England	+54	46	6.2	−11	0.9	107	9.999 026	− 5	1	56.0
66	Düsseldorf, Prussia	+51	12	25.0	−11	24.6	26	9.999 110	− 5	35	20.8
67	Edinburgh, Scotland	+55	55	28.0	−10	50.9	134	9.999 000	− 4	55	31.6
68	Edinburgh, Scotland	+55	57	23.2	−10	50.7	106	9.998 998	− 4	55	32.7
69	Evanston, Ill. . .	+42	3	33.4	−11	36.5	175	9.999 354	+ 0	42	26.5
70	Flagstaff, Ariz. .	+35	12	30.4	−10	59.2	2210	9.999 664	+ 2	18	28.7
71	Gaithersburg, Md.	+39	8	13.2	−11	25.4	165	9.999 427	+ 0	0	31.9
72	Geneva, N. Y. . .	+42	52	46.2	−11	38.3	152	9.999 331	− 0	0	14.7
73	Geneva, Switzerland	+46	11	58.8	−11	39.9	406	9.999 264	− 5	32	52.4
74	Genoa, Italy . .	+44	25	9.3	−11	40.2	105	9.999 288	− 5	43	57.1
75	Georgetown, D. C.	+38	54	26.7	−11	24.2	46	9.999 425	+ 0	0	2.4
76	Glasgow, Mo. . .	+39	13	45.6	−11	25.8	227	9.999 430	+ 1	3	2.3
77	Glasgow, Scotland.	+55	52	42.8	−10	51.5	55	9.998 997	− 4	51	5.2
78	Gotha, Germany .	+50	56	37.9	−11	25.9	320	9.999 136	− 5	51	6.2
79	Göttingen, Prussia	+51	31	47.9	−11	22.8	160	9.999 111	− 5	48	2.0
80	Greencastle, Ind. .	+39	38	46.6	−11	27.8	262	9.999 421	+ 0	39	8.5
81	Greenwich, England	+51	28	38.1	−11	23.1	47	9.999 104	− 5	8	15.7
82	Hamburg, Germany	+53	28	46.0	−11	10.6	40	9.999 054	− 5	49	14.3
83	Hamburg, Germany	+53	33	7.0	−11	10.1	25	9.999 051	− 5	48	9.6
84	Hamburg, Germany	+53	32	51.8	−11	10.2	30	9.999 051	− 5	48	9.2
85	Hanover, N. H. .	+43	42	15.3	−11	39.6	183	9.999 312	− 0	19	7.8
86	Haverford, Pa.. .	+40	0	40.1	−11	29.4	. . .	9.999 394	− 0	7	3.0
87	Heidelberg, Baden	+49	23	55.2	−11	32.6	570	9.999 192	− 5	43	8.9
88	Heidelberg, Baden	+49	23	54.9	−11	32.6	562	9.999 191	− 5	43	10.0
89	Helsingfors, Finland	+60	9	42.6	−10	5.6	38	9.998 896	− 6	48	4.9
90	Herény, Hungary .	+47	15	47.4	−11	38.4	229	9.999 224	− 6	14	40.5

Longitude from Greenwich.		Reduction from Gr. Sid. Time of Mean Noon to Local S. T. M. N.	Description.
In Time.	In Arc.		
h m s	° ′ ″	s	
+5 50 26.84	+ 87 36 42.6	+57.57	Old Obs.; transferred to Evanston, Ill., in 1887.
−0 42 53.52	− 10 43 22.8	− 7.05	Observatory of the University.
+5 37 41.40	+ 84 25 21.0	+55.48	Univ.Obs.on Mt.Lookout.OldObs.1′53″S.17^s.6W.
+5 26 25.82	+ 81 36 27.3	+53.62	Obs. of Case School of Applied Science.
+5 1 37.45	+ 75 24 21.7	+49.55	Litchfield Obs. of Hamilton College.
+0 33 43.1	+ 8 25 46.5	+ 5.54	Royal Astronomical Observatory of Portugal.
+6 9 18.33	+ 92 19 35.0	+60.67	Laws Observatory of the University of Missouri.
+5 32 2.6	+ 83 0 39.0	+54.55	Emerson McMillan Obs. of Ohio State Univ.
−0 50 18.70	− 12 34 40.5	− 8.26	University Observatory, Denmark.
+4 16 48.22	+ 64 12 3.3	+42.19	National Observatory of Argentine Republic.
−1 19 50.28	− 19 57 34.2	−13.12	Royal University Observatory.
−1 14 39.6	− 18 39 54.0	−12.26	Western Prussia.
−5 12 13.47	− 78 3 22.0	−51.29	Obs. Great Trigonometric Survey of India.
+6 59 47.63	+104 56 54.4	+68.96	Chamberlin Observatory of the Univ. of Denver.
+6 14 30.56	+ 93 37 38.4	+61.52	Drake University Observatory.
−1 46 53.29	− 26 43 19.3	−17.56	Observatory Imperial University (Jurjew).
−0 54 54.85	− 13 43 42.7	− 9.02	Baron Engelhardt's Observatory.
+0 25 21.1	+ 6 20 16.5	+ 4.16	Observatory of Trinity College at Dunsink.
+0 9 40.0	+ 2 25 0.0	+ 1.59	Formerly Lord Crawford's Observatory.
+0 6 19.75	+ 1 34 56.3	+ 1.04	Observatory of the University.
−0 27 5.0	− 6 46 15.0	− 4.45	Municipal Observatory, Bilk.
+0 12 44.2	+ 3 11 3.0	+ 2.09	Royal Obs. of Scotland, Blackford Hill.
+0 12 43.1	+ 3 10 46.5	+ 2.09	City Observatory, Calton Hill.
+5 50 42.3	+ 87 40 34.5	+57.61	Dearborn Observatory of North Western Univ.
+7 26 44.57	+111 41 8.6	+73.39	Lowell Observatory.
+5 8 47.73	+ 77 11 56.0	+50.73	International Latitude Observatory.
+5 8 1.00	+ 77 0 15.0	+50.60	Smith Observatory.
−0 24 36.71	− 6 9 10.7	− 4.04	Municipal Observatory.
−0 35 41.33	− 8 55 20.0	− 5.86	Hydrographic Institute.
+5 8 18.26	+ 77 4 33.9	+50.65	Georgetown College Observatory, Washington.
+6 11 18.08	+ 92 49 31.2	+61.00	Morrison Observatory.
+0 17 10.55	+ 4 17 38.3	+ 2.82	University Observatory.
−0 42 50.49	− 10 42 37.3	− 7.04	Ducal Observatory, Saxe-Coburg-Gotha.
−0 39 46.29	− 9 56 34.3	− 6.53	Royal University Observatory.
+5 47 24.34	+ 86 51 5.1	+57.07	McKim Observatory of De Pauw University.
0 0 0.00	0 0 0.0	0.00	Royal Observatory.
−0 40 58.5	− 10 14 37.5	− 6.73	New Observatory, Bergedorf.
−0 39 53.8	− 9 58 27.0	− 6.55	Old Observatory.
−0 39 53.42	− 9 58 21.3	− 6.55	Imperial Marine Observatory.
+4 49 7.91	+ 72 16 58.7	+47.50	Shattuck Observatory of Dartmouth College.
+5 1 12.70	+ 75 18 10.5	+49.48	Haverford College Observatory.
−0 34 53.13	− 8 43 17.0	− 5.73	Astronomical Institute, Königstuhl.
−0 34 54.25	− 8 43 33.7	− 5.73	Astrophysical Institute, Königstuhl.
−1 39 49.15	− 24 57 17.3	−16.40	University Observatory.
−1 6 24.7	− 16 36 10.5	−10.91	Astrophysical Obs., near Steinamanger.

No.	Place.	Geographic Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Washington.
		° ′ ″	′ ″			h m s
91	Hong Kong, China	+22 18 13.4	− 8 10.7	34	9.999 791	+11 15 2.
92	Iowa City, Iowa .	+41 40 0	−11 35.4	183	9.999 364	+ 0 57 50
93	Ithaca, N. Y. . .	+42 26 47.3	−11 37.4	256	9.999 349	− 0 2 19.
94	Jamaica, West Indies	+18 24 51	− 6 58.7	. . .	9.999 854	+ 0 3 13.
95	Jena, Saxe-Weimar	+50 55 34.9	−11 26.0	156	9.999 126	− 5 54 36.
96	Jena, Saxe-Weimar	+50 56 11.0	−11 25.9	174	9.999 126	− 5 54 36.
97	Johannesburg . .	−26 10 54.5	+ 9 13.5	1806	9.999 838	− 7 0 33.
98	Kalocsa	+46 31 41.7	−11 39.6	117	9.999 235	− 6 24 10.
99	Kasan, Russia . .	+55 50 20.0	−10 51.7	98	9.999 000	− 8 23 32.
100	Kasan, Russia . .	+55 47 24.3	−10 52.2	79	9.999 000	− 8 24 44.
101	Kew, Eng. . . .	+51 28 6	−11 23.2	11	9.999 102	− 5 7 0.
102	Kief, Russia . .	+50 27 10.5	−11 28.2	182	9.999 139	− 7 10 16.
103	Kiel, Prussia . .	+54 20 27.6	−11 4.3	48	9.999 033	− 5 48 51.
104	Kis-Kartal . . .	+47 41 54.8	−11 37.5	. . .	9.999 197	− 6 26 27.
105	Königsberg, Prussia	+54 42 50.4	−11 1.3	22	9.999 022	− 6 30 14.
106	Kremsmünster . .	+48 3 23.1	−11 36.7	384	9.999 214	− 6 4 47.
107	La Plata	−34 54 30.3	+10 56.7	12	9.999 521	− 1 16 38.
108	Lawrence, Kansas .	+36 57 30	−11 12.4	311	9.999 491	+ 1 12 42
109	Leiden, Netherlands	+52 9 20.0	−11 19.3	4	9.999 084	− 5 26 11.
110	Leipzig, Saxony .	+51 20 5.9	−11 23.9	119	9.999 112	− 5 57 49.
111	Liège, Belgium . .	+50 37 7	−11 27.5	127	9.999 132	− 5 30 31.
112	Lisbon, Portugal .	+38 42 30.5	−11 23.1	94	9.999 433	− 4 31 31.
113	Liverpool, Eng. .	+53 24 4.8	−11 11.2	62	9.999 057	− 4 55 58.
114	Lund, Sweden . .	+55 41 51.6	−10 53.0	38	9.999 000	− 6 1 0.
115	Lussinpiccolo . .	+44 32 11.0	−11 40.3	42	9.999 281	− 6 6 8.
116	Lyons, France . .	+45 41 41.0	−11 40.3	300	9.999 268	− 5 27 24.
117	Madison, Wis. . .	+43 4 36.8	−11 38.7	292	9.999 336	+ 0 49 22.
118	Madras, India . .	+13 4 8.0	− 5 7.6	7	9.999 925	−10 29 14.
119	Madrid, Spain . .	+40 24 29.7	−11 31.1	655	9.999 428	− 4 53 30.
120	Manila, P. I. . .	+14 35 25	− 5 40.5	3	9.999 907	+10 47 54
121	Mare Island, Cal. .	+38 5 55.8	−11 19.7	22	9.999 444	+ 3 0 49.
122	Markree, Ireland .	+54 10 31.8	−11 5.5	45	9.999 037	− 4 34 27.
123	Marseilles, France .	+43 18 17.5	−11 39.1	75	9.999 315	− 5 29 50.
124	Mauritius . . .	−20 5 39	+ 7 30.8	55	9.999 832	− 8 58 28.
125	Melbourne, Victoria	−37 49 53.4	+11 18.1	28	9.999 451	+ 9 11 50.
126	Meudon, France .	+48 48 18	−11 34.6	162	9.999 180	− 5 17 11.
127	Middletown, Conn.	+41 33 16.0	−11 35.1	. . .	9.999 355	− 0 17 38.
128	Milan, Italy . . .	+45 27 59.3	−11 40.4	120	9.999 262	− 5 45 1.
129	Minneapolis, Minn.	+44 58 40.0	−11 40.4	260	9.999 285	+ 1 4 41.
130	Mizusawa, Japan .	+39 8 3.6	−11 25.4	62	9.999 420	+ 9 27 13.
131	Modena, Italy . .	+44 38 52.8	−11 40.4	. . .	9.999 275	− 5 51 58.
132	Montreal, Canada .	+45 30 17.0	−11 40.4	67	9.999 258	− 0 13 57.
133	Moscow, Russia .	+55 45 19.8	−10 52.5	150	9.999 005	− 7 38 32.
134	Mount Hamilton .	+37 20 25.6	−11 14.9	1283	9.999 548	+ 2 58 19.
135	Mount Wilson . .	+34 12 59.5	−10 50.6	1800	9.999 660	+ 2 43 58.

No.	Longitude from Greenwich.		Reduction from Gr. Sid. Time of Mean Noon to Local S. T. M. N.	Description.
	In Time.	In Arc.		
	h m s	° ′ ″	s	
91	−7 36 41.86	−114 10 27.9	−75.01	British Colonial Observatory.
92	+6 6 6	+ 91 31 30	+60.14	Obs. of the State Univ. of Iowa.
93	+5 5 55.99	+ 76 28 59.9	+50.26	Observatory of Cornell University.
94	+5 11 29.48	+ 77 52 22.2	+51.17	Mr. Hall's Observatory, Montego Bay.
95	−0 46 20.27	− 11 35 4.0	− 7.61	University Observatory.
96	−0 46 20.78	− 11 35 11.7	− 7.61	The late Dr. Winkler's Observatory.
97	−1 52 18.0	− 28 4 30.0	−18.45	Government Observatory, Transvaal.
98	−1 15 54.34	− 18 58 35.1	−12.47	Haynald Obs., Hungary.
99	−3 15 16.5	− 48 49 7.5	−32.08	Englehardt Observatory.
100	−3 16 29.04	− 49 7 15.6	−32.28	Imperial Univ. Observatory.
101	+0 1 15.1	+ 0 18 46.5	+ 0.21	Meteorological Obs., Kew Gardens, London.
102	−2 2 0.64	− 30 30 9.6	−20.04	Imperial University Observatory.
103	−0 40 35.55	− 10 8 53.3	− 6.67	Old position of Transit Circle, $0''.9$ N., $0^{s}.12$ E.
104	−1 18 11.7	− 19 32 55.5	−12.85	Near Aszód, Hungary.
105	−1 21 59.04	− 20 29 45.6	−13.47	Royal University Observatory.
106	−0 56 31.59	− 14 7 53.9	− 9.29	Obs. of the Benedictines, Austria.
107	+3 51 37.0	+ 57 54 15.0	+38.05	Obs. National Univ., Argentine Republic.
108	+6 20 58	+ 95 14 30	+62.58	Obs. of the State Univ. of Kansas.
109	−0 17 56.17	− 4 29 2.6	− 2.95	University Observatory.
110	−0 49 33.98	− 12 23 29.7	− 8.14	University Observatory.
111	−0 22 15.2	− 5 33 48.0	− 3.66	University Observatory, Cointe.
112	+0 36 44.68	+ 9 11 10.2	+ 6.04	Royal Astronomical Obs., Tapada.
113	+0 12 17.33	+ 3 4 20.0	+ 2.02	Bidston, Birkenhead.
114	−0 52 45.01	− 13 11 15.1	− 8.67	Royal Observatory of the University.
115	−0 57 52.41	− 14 28 6.1	− 9.51	Manora Observatory, Austria.
116	−0 19 8.55	− 4 47 8.3	− 3.14	Obs. of the Univ., St. Genis, Laval.
117	+5 57 37.93	+ 89 24 29.0	+58.75	Washburn Obs. of Univ. of Wisconsin.
118	−5 20 59.12	− 80 14 46.8	−52.73	Founded by East India Company.
119	+0 14 45.12	+ 3 41 16.8	+ 2.42	Ast. and Meteorological Observatory.
120	−8 3 50	−120 57 30	−79.48	Meteorological Observatory.
121	+8 9 5.6	+122 16 24.0	+80.35	Chronometer and Time Station, Navy Yard.
122	+0 33 48.4	+ 8 27 6.0	+ 5.55	Obs. of Col. Cooper, near Collooney.
123	−0 21 34.59	− 5 23 38.9	− 3.54	National Obs., Univ. of Aix-Marseilles.
124	−3 50 12.6	− 57 33 9.0	−37.82	Royal Alfred Observatory, Port-Louis.
125	−9 39 54.0	−144 58 30.0	−95.26	State Obs.; transf. from Williamstown in 1861.
126	−0 8 55.6	− 2 13 54.0	− 1.47	Seine-et-Oise, near Paris.
127	+4 50 37.18	+ 72 39 17.7	+47.74	Wesleyan University Observatory.
128	−0 36 45.92	− 9 11 28.8	− 6.04	Royal Observatory, Brera.
129	+6 12 56.84	+ 93 14 12.6	+61.27	Obs. of the State University of Minnesota.
130	−9 24 30.75	−141 7 41.3	−92.74	International Latitude Observatory.
131	−0 43 42.9	− 10 55 43.5	− 7.18	Ducal Observatory.
132	+4 54 18.63	+ 73 34 39.4	+48.35	McGill University Observatory.
133	−2 30 17.09	− 37 34 16.3	−24.69	Obs. of the Imperial University, Presnia.
134	+8 6 34.89	+121 38 43.3	+79.93	Lick Obs. of the University of California.
135	+7 52 14.33	+118 3 34.9	+77.58	Solar Observatory, near Pasadena, Cal.

No.	Place.	Geographic Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Washington.
		° ′ ″	′ ″			h m s
136	Munich, Bavaria .	+48 8 45.5	−11 36.5	528	9.999 222	− 5 54 41.85
137	Naples, Italy . .	+40 51 46.3	−11 32.8	154	9.999 382	− 6 5 17.51
138	Nashville, Tenn. .	+36 8 54.4	−11 6.6	. . .	9.999 490	+ 0 38 56.4
139	Natal, S. Africa .	−29 50 46.6	+10 3.7	79	9.999 642	− 7 12 16.96
140	Neuchâtel . . .	+47 0 1.2	−11 38.9	488	9.999 248	− 5 36 5.71
141	New Brunswick, N. J.	+40 30 1.3	−11 31.5	21	9.999 383	− 0 10 28.4
142	New Haven, Conn.	+41 19 22.3	−11 34.4	40	9.999 364	− 0 16 35.20
143	New York, N. Y. .	+40 48 34.6	−11 32.6	. . .	9.999 374	− 0 12 26
144	Nice, France . .	+43 43 16.9	−11 39.6	376	9.999 325	− 5 37 27.96
145	Nikolaieff, Russia .	+46 58 21.8	−11 38.9	55	9.999 220	− 7 16 9.58
146	Northampton, Mass.	+42 19 2	−11 37.2	81	9.999 340	− 0 17 42.7
147	Northfield, Minn. .	+44 27 41.6	−11 40.3	320	9.999 302	+ 1 4 20.03
148	Oakland, Cal. . .	+37 48 5	−11 17.9	11	9.999 450	+ 3 0 50.77
149	Odessa, Russia . .	+46 28 37.9	−11 39.6	. . .	9.999 228	− 7 11 18.0
150	Odessa, Russia . .	+46 28 36.7	−11 39.6	55	9.999 232	− 7 11 17.88
151	O-Gyalla, Hungary	+47 52 27.3	−11 37.1	113	9.999 200	− 6 21 1.32
152	Omaha, Nebr. . .	+41 16 5.6	−11 34.3	344	9.999 384	+ 1 15 31.18
153	Oncativo, Arg. Rep.	−31 55 10	+10 27.8	280	9.999 610	− 0 53 31.0
154	Orono, Maine . .	+44 53 58	−11 40.4	41	9.999 272	− 0 33 35.5
155	Ottawa, Canada .	+45 23 30	−11 40.4	85	9.999 262	− 0 5 22
156	Oxford, Miss. . .	+34 22 12.6	−10 52.0	. . .	9.999 533	+ 0 49 51.3
157	Oxford, Eng. . .	+51 45 35.4	−11 21.6	65	9.999 098	− 5 3 13.2
158	Oxford, Eng. . .	+51 45 34.2	−11 21.6	64	9.999 098	− 5 3 15.4
159	Padua, Italy . .	+45 24 5	−11 40.4	30	9.999 258	− 5 55 44.97
160	Palermo, Sicily. .	+38 6 44.0	−11 19.7	72	9.999 447	− 6 1 41.68
161	Paris, France . .	+48 50 11.2	−11 34.5	61	9.999 172	− 5 17 36.75
162	Perth	−31 57 8.9	+10 28.1	61	9.999 594	+11 8 22.48
163	Philadelphia, Pa. .	+39 58 2.1	−11 29.2	74	9.999 400	− 0 7 9.2
164	Pola, Austria . .	+44 51 48.7	−11 40.4	30	9.999 272	− 6 3 38.67
165	Potsdam, Prussia .	+52 22 56.0	−11 17.9	97	9.999 085	− 6 0 31.7
166	Poughkeepsie, N. Y.	+41 41 18	−11 35.5	46	9.999 354	− 0 12 42.13
167	Prague, Bohemia .	+50 5 15.8	−11 29.8	197	9.999 149	− 6 5 56.1
168	Princeton, N. J. .	+40 20 55.8	−11 30.9	50	9.999 389	− 0 9 36.34
169	Providence, R. I. .	+41 50 21	−11 35.9	64	9.999 352	− 0 22 39.83
170	Providence, R. I. .	+41 49 46.4	−11 35.9	. . .	9.999 348	− 0 22 38.14
171	Pulkowa, Russia .	+59 46 18.7	−10 10.4	74	9.998 907	− 7 9 34.42
172	Quebec, Canada .	+46 47 59.2	−11 39.2	90	9.999 226	− 0 23 23.14
173	Quito	− 0 14 0	+ 0 5.7	2908	0.000 198	+ 0 5 50.88
174	Riga, Russia . .	+56 57 9.3	−10 41.3	. . .	9.998 967	− 6 44 43.95
175	Rio de Janeiro . .	−22 54 23.6	+ 8 21.1	61	9.999 783	− 2 15 34.4
176	Rome, Italy . .	+41 53 53.6	−11 36.1	51	9.999 350	− 5 58 11.33
177	Rome, Italy. . .	+41 53 33.5	−11 36.0	65	9.999 350	− 5 58 12.15
178	Rome, Italy. . .	+41 54 4.8	−11 36.1	100	9.999 353	− 5 58 5.25
179	San Fernando . .	+36 27 42.0	−11 8.9	30	9.999 485	− 4 43 26.6
180	San Francisco, Cal.	+37 47 27.9	−11 17.8	. . .	9.999 450	+ 3 1 27.08

No.	Longitude from Greenwich.		Reduction from Gr. Sid. Time of Mean Noon to Local S. T. M. N.	Description.
	In Time.	In Arc.		
	h m s	° ′ ″	s	
136	−0 46 26.07	− 11 36 31.0	− 7.63	Royal Observatory.
137	−0 57 1.73	− 14 15 26.0	− 9.37	Royal Obs., Capo di Monte.
138	+5 47 12.2	+ 86 48 3.0	+57.04	Observatory of Vanderbilt University.
139	−2 4 1.18	− 31 0 17.7	−20.37	Government Observatory, Durban.
140	−0 27 49.93	− 6 57 29.0	− 4.57	Cantonal Observatory, Switzerland.
141	+4 57 47.4	+ 74 26 51	+48.92	Schanck Obs., Rutgers College.
142	+4 51 40.58	+ 72 55 8.7	+47.92	Yale University Obs. Old Obs. 45″.8 S., $1^{s}.58$ W.
143	+4 55 50	+ 73 57 30	+48.60	Columbia Univ. Obs. Old Obs. 3′ 11″.5 S., $3^{s}.6$ E.
144	−0 29 12.18	− 7 18 2.7	− 4.80	Mt. Gros, near Nice.
145	−2 7 53.80	− 31 58 27.0	−21.01	Naval Observatory.
146	+4 50 33.1	+ 72 38 16.5	+47.73	Smith College Observatory.
147	+6 12 35.81	+ 93 8 57.1	+61.21	Goodsell Observatory of Carleton College.
148	+8 9 6.55	+122 16 38.3	+80.35	Chabot University.
149	−2 3 2.18	− 30 45 32.7	−20.21	Branch of Pulkowa Observatory.
150	−2 3 2.10	− 30 45 31.5	−20.21	University Observatory.
151	−1 12 45.54	− 18 11 23.1	−11.95	Royal Astrophysical Observatory.
152	+6 23 46.96	+ 95 56 44.4	+63.05	Creighton University Observatory.
153	+4 14 44.8	+ 63 41 12.0	+41.85	International Latitude Observatory.
154	+4 34 40.3	+ 68 40 4.5	+45.12	Observatory of the University of Maine.
155	+5 2 54	+ 75 43 30	+49.76	Dominion Observatory.
156	+5 58 7.1	+ 89 31 46.5	+58.83	Observatory of the University of Mississippi.
157	+0 5 2.6	+ 1 15 39.0	+ 0.83	Radcliffe Observatory.
158	+0 5 0.4	+ 1 15 6.0	+ 0.82	University Observatory.
159	−0 47 29.19	− 11 52 17.9	− 7.80	Royal University Observatory.
160	−0 53 25.90	− 13 21 28.5	− 8.78	Royal Observatory.
161	−0 9 20.97	− 2 20 14.6	− 1.53	National Observatory.
162	−7 43 21.74	−115 50 26.1	−76.12	State Observatory, West Australia.
163	+5 1 6.6	+ 75 16 39.0	+49.46	Flower Observatory, University of Pennsylvania.
164	−0 55 22.89	− 13 50 43.3	− 9.10	Obs. of the Imperial Hydrographic Office.
165	−0 52 15.9	− 13 3 58.5	− 8.59	Royal Astrophysical Observatory.
166	+4 55 33.65	+ 73 53 24.7	+48.55	Vassar College Observatory.
167	−0 57 40.3	− 14 25 4.5	− 9.47	Royal Observatory of the University.
168	+4 58 39.44	+ 74 39 51.6	+49.06	Halsted Observatory of Princeton University.
169	+4 45 35.95	+ 71 23 59.3	+46.92	Ladd Observatory of Brown University.
170	+4 45 37.64	+ 71 24 24.6	+46.92	Mr. Seagrave's Observatory.
171	−2 1 18.64	− 30 19 39.6	−19.93	Obs. Central Nicolas, near St. Petersburg.
172	+4 44 52.64	+ 71 13 9.6	+46.80	Bonner's Hill.
173	+5 14 6.66	+ 78 31 39.9	+51.60	National Observatory of Ecuador.
174	−1 36 28.17	− 24 7 2.6	−15.85	Polytechnic School Observatory.
175	+2 52 41.4	+ 43 10 21.0	+28.37	National Observatory of Brazil.
176	−0 49 55.55	− 12 28 53.3	− 8.20	Royal Observatory at Roman College.
177	−0 49 56.37	− 12 29 5.6	− 8.20	Royal University Observatory at Capitol.
178	−0 49 49.47	− 12 27 22.0	− 8.18	Vatican Observatory.
179	+0 24 49.2	+ 6 27 18.0	+ 4.08	Naval Observatory, near Cadiz, Spain.
180	+8 9 42.86	+122 25 42.9	+80.45	Davidson Observatory.

No.	Place.	Geographic Latitude.			Reduction to Geocentric Latitude.		Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Washington.		
		°	′	″	′	″			h	m	s
181	San Luis, Arg. Rep.	−33	17	45.7	+10	41.9	800	9.999 613	− 0	42	54
182	Santiago, Chile	−33	26	42.0	+10	43.4	519	9.999 590	− 0	25	29.56
183	South Hadley, Mass.	+42	15	18.2	−11	37.0	76	9.999 342	− 0	17	55.49
184	St. Louis, Mo.	+38	38	3.0	−11	22.7	. . .	9.999 429	+ 0	52	33.48
185	St. Petersburg	+59	56	32.0	−10	8.4	4	9.998 898	− 7	9	27.2
186	Stockholm, Sweden	+59	20	33.0	−10	15.5	44	9.998 915	− 6	20	29.77
187	Stonyhurst, Eng.	+53	50	40	−11	8.0	116	9.999 050	− 4	58	23.10
188	Strassburg, Alsace	+48	35	0.3	−11	35.3	144	9.999 184	− 5	39	20.47
189	Sydney, N. S. W.	−33	51	41.1	+10	47.3	44	9.999 548	+ 8	46	54.68
190	Syracuse, N. Y.	+43	2	13.1	−11	38.6	160	9.999 328	− 0	3	42.42
191	Tacubaya	+19	24	17.5	− 7	17.8	2280	9.999 994	+ 1	28	30.75
192	Tashkent	+41	19	31.3	−11	34.4	457	9.999 392	− 9	45	26.58
193	Taunton, Mass	+41	54	0	−11	36.1	8	9.999 347	− 0	23	56
194	Teramo, Italy	+42	39	27	−11	37.9	398	9.999 354	− 6	3	12
195	Tokyo, Japan	+35	39	17.5	−11	2.8	. . .	9.999 502	+ 9	32	46.20
196	Toronto, Canada	+43	39	35.9	−11	39.6	108	9.999 308	+ 0	9	18.87
197	Toulouse, France	+43	36	45	−11	39.5	194	9.999 315	− 5	14	5.66
198	Triest, Austria	+45	38	45.4	−11	40.3	67	9.999 255	− 6	3	18.73
199	Troy, N. Y.	+42	43	52.9	−11	38.1	. . .	9.999 325	− 0	13	33.49
200	Tschardjui	+39	8	10.7	−11	25.4	167	9.999 427	− 9	22	13.1
201	Tulse Hill	+51	26	47.0	−11	23.3	48	9.999 105	− 5	7	48.1
202	Turin, Italy	+45	4	8.0	−11	40.4	276	9.999 284	− 5	39	2.96
203	Tuscaloosa, Ala.	+33	12	36.8	−10	41.1	. . .	9.999 561	+ 0	41	55.96
204	Ukiah, Cal.	+39	8	12.1	−11	25.4	220	9.999 431	+ 3	3	53
205	Upsala, Sweden	+59	51	29.4	−10	9.3	21	9.998 901	− 6	18	45.93
206	Urbana, Ill.	+40	6	20.2	−11	29.8	236	9.999 408	+ 0	44	38.2
207	Utrecht, Netherlands	+52	5	9.6	−11	19.7	13	9.999 087	− 5	28	46.8
208	Venice, Italy	+45	26	10.5	−11	40.4	15	9.999 256	− 5	57	37.90
209	Vienna, Austria	+48	13	55.4	−11	36.2	240	9.999 199	− 6	13	37.17
210	Vienna, Austria	+48	12	53.8	−11	36.2	214	9.999 198	− 6	13	41.1
211	Vienna, Austria	+48	12	46.7	−11	36.2	280	9.999 202	− 6	13	26.89
212	Warsaw, Russia	+52	13	4.7	−11	18.9	110	9.999 090	− 6	32	23.06
213	Washington, D. C.	+38	55	14.0	−11	24.2	82	9.999 428	0	0	0.00
214	Washington, D. C.	+38	53	38.8	−11	24.1	31	9.999 424	− 0	0	3.63
215	Washington, D. C.	+38	53	17.3	−11	24.1	9	9.999 422	− 0	0	9.6
216	Washington, D. C.	+38	56	14.8	−11	24.2	. . .	9.999 422	− 0	0	15.78
217	Wellesley, Mass.	+42	17	43	−11	37.1	61	9.999 340	− 0	23	3
218	Wellington	−41	18	0.6	+11	34.3	47	9.999 364	+ 7	12	37.70
219	West Point, N. Y.	+41	23	22.1	−11	34.6	170	9.999 371	− 0	12	25.23
220	Wilhelmshaven	+53	31	52.2	−11	10.3	8	9.999 051	− 5	40	50.89
221	Williams Bay, Wis.	+42	34	12.6	−11	37.7	335	9.999 352	+ 0	45	57.46
222	Williamstown, Mass.	+42	42	30	−11	38.0	213	9.999 340	− 0	15	26
223	Windsor, N. S. W.	−33	36	30.8	+10	44.9	16	9.999 552	+ 8	48	23.7
224	Zô-Sè, China	+31	5	47.7	−10	18.6	100	9.999 617	+10	46	59.5
225	Zürich	+47	22	40.0	−11	38.2	470	9.999 237	− 5	42	28.08

No.	Longitude from Greenwich.		Reduction from Gr. Sid. Time of Mean Noon to Local S. T. M. N.	Description.
	In Time.	In Arc.		
	h m s	° ′ ″	s	
181	+ 4 25 22	+ 66 20 30	+ 43.60	Southern Observatory of Carnegie Institution.
182	+ 4 42 46.22	+ 70 41 33.3	+ 46.45	National Obs. of Chile. Old Obs. 16″.6 N., 9ˢ.5 E.
183	+ 4 50 20.29	+ 72 35 4.3	+ 47.70	Observatory of Mt. Holyoke College.
184	+ 6 0 49.26	+ 90 12 18.9	+ 59.27	Washington University Observatory.
185	− 2 1 11.4	− 30 17 51.0	− 19.91	Imperial University Observatory, Russia.
186	− 1 12 13.99	− 18 3 29.9	− 11.87	Observatory of Academy of Science.
187	+ 0 9 52.68	+ 2 28 10.2	+ 1.62	Stonyhurst College Observatory, near Blackburn.
188	− 0 31 4.69	− 7 46 10.3	− 5.11	Imperial University Observatory.
189	−10 4 49.54	−151 12 23.1	− 99.36	Government Observatory, South Australia.
190	+ 5 4 33.36	+ 76 8 20.4	+ 50.03	Observatory of Syracuse University.
191	+ 6 36 46.53	+ 99 11 38.0	+ 65.18	National Observatory of Mexico.
192	− 4 37 10.80	− 69 17 42.0	− 45.53	Turkestan, Russia.
193	+ 4 44 20	+ 71 5 0	+ 46.71	Mr. Metcalf's Observatory.
194	− 0 54 56	− 13 44 0	− 9.02	At Collurania, near Teramo.
195	− 9 18 58.02	−139 44 30.3	− 91.82	University Observatory.
196	+ 5 17 34.65	+ 79 23 39.7	+ 52.17	University Observatory.
197	− 0 5 49.88	− 1 27 28.2	− 0.96	University Observatory.
198	− 0 55 2.95	− 13 45 44.3	− 9.04	Imperial Maritime Observatory.
199	+ 4 54 42.29	+ 73 40 34.3	+ 48.41	Observatory Rensselaer Polytechnic Institute.
200	− 4 13 57.3	− 63 29 19.5	− 41.72	International Latitude Obs., Turkestan.
201	+ 0 0 27.7	+ 0 6 55.5	+ 0.08	Observatory of Sir W. Huggins, London.
202	− 0 30 47.18	− 7 41 47.7	− 5.06	Royal Observatory, Palazzo Madama.
203	+ 5 50 11.74	+ 87 32 56.1	+ 57.53	Observatory of the University of Alabama.
204	+ 8 12 9	+123 2 15	+ 80.85	International Latitude Observatory.
205	− 1 10 30.15	− 17 37 32.3	− 11.58	University Observatory.
206	+ 5 52 54.0	+ 88 13 30	+ 57.97	Observatory of the University of Illinois.
207	− 0 20 31.0	− 5 7 45.0	− 3.37	University Observatory, Sonnenborgh.
208	− 0 49 22.12	− 12 20 31.8	− 8.11	Observatory of the Nautical Institute.
209	− 1 5 21.39	− 16 20 20.9	− 10.74	Imperial Univ. Obs. Old Obs. 1′ 20″ S., 10ˢ.25 E.
210	− 1 5 25.3	− 16 21 19.5	− 10.75	Oppolzer Observatory, Josephstadt.
211	− 1 5 11.11	− 16 17 46.7	− 10.71	Kuffner Observatory, Ottakring.
212	− 1 24 7.28	− 21 1 49.2	− 13.82	Imperial University Observatory.
213	+ 5 8 15.78	+ 77 3 56.7	+ 50.64	U. S. Naval Observatory, Georgetown Heights.
214	+ 5 8 12.15	+ 77 3 2.3	+ 50.63	Old U. S. Naval Observatory. 1842–1893.
215	+ 5 8 6.2	+ 77 1 33.0	+ 50.61	Smithsonian Astrophysical Observatory.
216	+ 5 8 0.0	+ 77 0 0.0	+ 50.60	Catholic University Obs., Brookland, D. C.
217	+ 4 45 13	+ 71 18 15	+ 46.85	Whitin Observatory of Wellesley College.
218	−11 39 6.52	−174 46 37.8	−114.85	Colonial Time Service Obs. of New Zealand.
219	+ 4 55 50.55	+ 73 57 38.3	+ 48.60	U. S. Military Academy. Old Obs. 9″ N., 1ˢ.2 E.
220	− 0 32 35.11	− 8 8 46.7	− 5.35	Imperial Naval Observatory of Germany.
221	+ 5 54 13.24	+ 88 33 18.6	+ 58.19	Yerkes Observatory of University of Chicago.
222	+ 4 52 50	+ 73 12 30	+ 48.10	Field Memorial Observatory, Williams College.
223	−10 3 20.5	−150 50 7.5	− 99.11	Mr. John Tebbutt's Observatory.
224	− 8 4 44.7	−121 11 10.5	− 79.63	Obs. of the Jesuits near Shanghai.
225	− 0 34 12.30	− 8 33 4.5	− 5.62	Obs. of the Polytechnic School, Switzerland.

THE COMPUTATION OF LUNAR DISTANCES.

The tables of lunar distances formerly given on pages XIII to XVIII, inclusive, for each month of the Greenwich Ephemeris, are omitted, as it has been decided by the authorities of the Navy Department that they are now of little practical use to navigators. However, in case it is desired to use this method, the angular distance between the Moon and any heavenly body may be calculated by solving the spherical triangle of which the known parts are the polar distances of the Moon and the other body and the difference of their right ascensions, or, in other words, the angle at the pole between their hour-circles. Then, the Greenwich mean time of the observation being approximately known, and the lunar distances for the star or other body calculated for the even hour before and after, the required lunar distance may be interpolated and the longitude derived by the methods given in Bowditch and other books on navigation.

EXAMPLE 1.

Find the lunar distance of Pollux, January 17, 1914, at 10 P. M. Greenwich Mean Time.

Let α and δ = Right Ascension and Declination of the star
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let $\tan M = \tan \delta' \sec (\alpha - \alpha')$
Then $\cos D = \sin \delta' \cos (M - \delta) \operatorname{cosec} M$

$\alpha = 7^h\ 40^m\ 5^s.5$
$\alpha' = 12^h\ 42^m\ 27^s.3$
$\alpha - \alpha' = -\ 5^h\ 2^m\ 21^s.8$
$\alpha - \alpha' = -75^\circ\ 35'\ 27''$
$\delta' = -\ 7^\circ\ 4'\ 0''$
$\tan \delta' = 9.093302\ n$
$\sec (\alpha - \alpha') = \underline{0.604071}$
$\tan M = 9.697373\ n$

$M = -26^\circ\ 28'\ 51''$
$\delta = +28^\circ\ 14'\ 9''$
$M - \delta = -54^\circ\ 43'\ 0''$
$\sin \delta' = 9.089990\ n$
$\cos (M - \delta) = 9.761642$
$\operatorname{cosec} M = \underline{0.350764\ n}$
$\cos D = 9.202396$
$D = 80^\circ\ 49'\ 48''$

EXAMPLE 2.

Find the lunar distance of Jupiter, July 11, 1914, at midnight, Greenwich Mean Time. In this case the distance is smaller and the following method is more accurate:

Let α and δ = Right Ascension and Declination of the planet
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let $\tan N = \tan \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} \frac{1}{2} (\delta - \delta')$
Then $\sin \frac{1}{2} D = \sin \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} N$
Sin N and $\sin \frac{1}{2} (\alpha - \alpha')$ have the same algebraic sign.

$\alpha = 21^h\ 34^m\ 10^s.0$
$\alpha' = 22^h\ 53^m\ 29^s.4$
$\alpha - \alpha' = -\ 1^h\ 19^m\ 19^s.4$
$\alpha - \alpha' = -19^\circ\ 49'\ 51''$
$\delta = -15^\circ\ 25'\ 17''$
$\delta' = -\ 6^\circ\ 33'\ 6''$
$\delta + \delta' = -21^\circ\ 58'\ 23''$
$\delta - \delta' = -\ 8^\circ\ 52'\ 11''$

$\frac{1}{2} (\alpha - \alpha') = -\ 9^\circ\ 54'\ 56''$
$\frac{1}{2} (\delta + \delta') = -10^\circ\ 59'\ 12''$
$\frac{1}{2} (\delta - \delta') = -\ 4^\circ\ 26'\ 6''$

$\tan \frac{1}{2} (\alpha - \alpha') = 9.242561\ n$
$\cos \frac{1}{2} (\delta + \delta') = 9.991966$
$\operatorname{cosec} \frac{1}{2} (\delta - \delta') = 1.111663\ n$
$\tan N = 0.346190$
$N = 245^\circ\ 44'\ 34''$

$\sin \frac{1}{2} (\alpha - \alpha') = 9.236024\ n$
$\cos \frac{1}{2} (\delta + \delta') = 9.991966$
$\operatorname{cosec} N = \underline{0.040143\ n}$
$\sin \frac{1}{2} D = 9.268133$
$\frac{1}{2} D = 10^\circ\ 41'\ 6''$
$D = 21^\circ\ 22'\ 12''$

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1914.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

Take out the App. R. A. and App. Decl. of Polaris for the time of observation (pp. 251–262).

Subtract the App. R. A. from the local sidereal time of observation and the remainder is the hour-angle of Polaris.

With this hour-angle as the vertical argument, and the App. Decl. of Polaris as the horizontal argument, take out the correction from Table I and add it to or subtract it from the true altitude, according to its sign.

For other altitudes than 45°, corrections taken from the supplementary table at the bottom of Table I (Table Ia) may be applied when necessary for the degree of accuracy required.

Example.—1914, October 7, at $10^h\ 40^m\ 30^s$ P. M. local mean solar time, in longitude 59° west of Greenwich, suppose the true altitude of Polaris to be 33° 20′ 0″, required the latitude of the place.

	h	m	s
Local astronomical mean time	10	40	30
Reductions from Table III for $10^h\ 40^m\ 30^s$		+1	45
Greenwich sidereal time of mean noon, October 7, page 111	13	1	9
Reduction from Table III, for longitude (=$3^h\ 56^m$ west, or plus)		+0	39
	h	m	s
Sum (having regard to signs) is equal to local sidereal time	23	44	3
R. A. of Polaris (page 260) for time of observation	1	29	48
	h	m	s
Remainder is equal to hour-angle of Polaris	22	14	15
Decl. of Polaris (page 260) for time of observation 88° 51′ 6″			
	°	′	″
True altitude	+33	20	0
Correction from Table I	−1	1	34
Correction from Table Ia			−3
	°	′	″
Latitude of the place	+32	18	23

Observations of Polaris for latitude should be made when practicable near the times of upper or of lower culminations (hour-angle 0^h or 12^h). However, at sea, if made near elongation (hour-angle 6^h or 18^h), the hour-angle, and hence the local time, should be known within one minute.

H. A. \ Decl.	88° 50′ 40″		88° 50′ 50″		88° 51′ 0″		88° 51′ 10″		88° 51′ 20″		88° 51′ 30″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
0 0	−69 20		−69 10		−69 0		−68 50		−68 40		−68 30		24 0
3	69 19	1	69 9	1	68 59	1	68 49	1	68 40	0	68 30	0	23 57
6	69 18	1	69 8	1	68 58	1	68 48	1	68 39	1	68 29	1	54
9	69 16	2	69 6	2	68 56	2	68 46	2	68 37	2	68 27	2	51
12	69 14	2	69 4	2	68 54	2	68 44	2	68 34	3	68 24	3	48
0 15	−69 11	3	−69 1	3	−68 51	3	−68 41	3	−68 31	3	−68 21	3	23 45
18	69 7	4	68 57	4	68 47	4	68 37	4	68 27	4	68 17	4	42
21	69 2	5	68 52	5	68 42	5	68 32	5	68 22	5	68 12	5	39
24	68 56	6	68 46	6	68 36	6	68 27	5	68 17	5	68 7	5	36
27	68 50	6	68 40	6	68 30	6	68 21	6	68 11	6	68 1	6	33
0 30	−68 43	7	−68 33	7	−68 23	7	−68 14	7	−68 4	7	−67 54	7	23 30
33	68 36	7	68 26	7	68 16	7	68 6	8	67 56	8	67 47	7	27
36	68 28	8	68 18	8	68 8	8	67 58	8	67 48	8	67 39	8	24
39	68 19	9	68 9	9	67 59	9	67 49	9	67 39	9	67 30	9	21
42	68 9	10	67 59	10	67 49	10	67 39	10	67 30	9	67 20	10	18
0 45	−67 58	11	−67 48	11	−67 38	11	−67 29	10	−67 19	11	−67 10	10	23 15
48	67 47	11	67 37	11	67 27	11	67 18	11	67 8	11	66 59	11	12
51	67 35	12	67 25	12	67 15	12	67 6	12	66 56	12	66 47	12	9
54	67 22	13	67 12	13	67 2	13	66 53	13	66 44	12	66 34	13	6
0 57	67 9	13	66 59	13	66 49	13	66 40	13	66 31	13	66 21	13	3
1 0	−66 55	14	−66 45	14	−66 35	14	−66 26	14	− 66 17	14	−66 7	14	23 0
3	66 41	14	66 31	14	66 21	14	66 12	14	66 2	15	65 53	14	22 57
6	66 26	15	66 16	15	66 6	15	65 57	15	65 47	15	65 38	15	54
9	66 9	17	65 59	17	65 50	16	65 41	16	65 31	16	65 22	16	51
1 12	−65 52	17	−65 42	17	−65 33	17	−65 24	17	−65 14	17	−65 5	17	22 48

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 191

Decl. H. A.	88° 50′ 40″		88° 50′ 50″		88° 51′ 0″		88° 51′ 10″		88° 51′ 20″		88° 51′ 30″		Decl. H.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
1 12	−65 52	18	−65 42	17	−65 33	18	−65 24	18	−65 14	17	−65 5	17	22 48
15	65 34	18	65 25	18	65 15	18	65 6	18	64 57	18	64 48	18	45
18	65 16	19	65 7	19	64 57	18	64 48	18	64 39	19	64 30	19	42
21	64 57	19	64 48	19	64 39	20	64 30	20	64 20	19	64 11	19	39
24	64 38	20	64 29	20	64 19	20	64 10	20	64 1	20	63 52	20	36
1 27	−64 18	21	−64 9	21	−63 59	20	−63 50	20	−63 41	21	−63 32	21	22 33
30	63 57	22	63 48	22	63 39	22	63 30	22	63 20	21	63 11	21	30
33	63 35	22	63 26	22	63 17	22	63 8	22	62 59	22	62 50	22	27
36	63 13	23	63 4	23	62 55	23	62 46	23	62 37	23	62 28	23	24
39	62 50	23	62 41	23	62 32	23	62 23	23	62 14	23	62 5	23	21
1 42	−62 27	24	−62 18	24	−62 9	24	−62 0	24	−61 51	24	−61 42	24	22 18
45	62 3	25	61 54	25	61 45	25	61 36	24	61 27	25	61 18	24	15
48	61 38	26	61 29	25	61 20	25	61 12	26	61 2	25	60 54	25	12
51	61 12	26	61 4	26	60 55	26	60 46	26	60 37	26	60 29	26	9
54	60 46	27	60 38	27	60 29	27	60 20	26	60 11	26	60 3	27	6
1 57	−60 19	27	−60 11	27	−60 2	27	−59 54	27	−59 45	27	−59 36	27	22 3
2 0	59 52	28	59 44	28	59 35	28	59 27	28	59 18	28	59 9	28	22 0
3	59 24	29	59 16	29	59 7	29	58 59	29	58 50	28	58 41	28	21 57
6	58 55	29	58 47	29	58 38	29	58 30	29	58 22	29	58 13	29	54
9	58 26	30	58 18	30	58 9	29	58 1	29	57 53	30	57 44	29	51
2 12	−57 56	30	−57 48	30	−57 40	31	−57 32	31	−57 23	30	−57 15	30	21 48
15	57 26	31	57 18	31	57 9	31	57 1	31	56 53	31	56 45	31	45
18	56 55	32	56 47	32	56 38	31	56 30	31	56 22	31	56 14	31	42
21	56 23	32	56 15	32	56 7	32	55 59	32	55 51	32	55 43	32	39
24	55 51	33	55 43	33	55 35	33	55 27	33	55 19	33	55 11	32	36
2 27	−55 18	34	−55 10	33	−55 2	33	−54 54	33	−54 46	33	−54 39	33	21 33
30	54 44	34	54 37	34	54 29	34	54 21	33	54 13	33	54 6	34	30
33	54 10	35	54 3	35	53 55	35	53 48	35	53 40	34	53 32	34	27
36	53 35	35	53 28	35	53 20	34	53 13	34	53 6	35	52 58	35	24
39	53 0	36	52 53	36	52 46	36	52 39	36	52 31	35	52 23	35	21
2 42	−52 24	36	−52 17	36	−52 10	36	−52 3	36	−51 56	36	−51 48	36	21 18
45	51 48	36	51 41	36	51 34	36	51 27	36	51 20	37	51 12	36	15
48	51 12	37	51 5	37	50 58	37	50 51	37	50 43	37	50 36	37	12
51	50 35	38	50 28	38	50 21	38	50 14	38	50 6	37	49 59	37	9
54	49 57	38	49 50	38	49 43	38	49 36	38	49 29	38	49 22	38	6
2 57	−49 19	38	−49 12	38	−49 5	38	−48 58	38	−48 51	38	−48 44	38	21 3
3 0	48 41	39	48 34	39	48 27	39	48 20	39	48 13	39	48 6	39	21 0
3	48 2	40	47 55	40	47 48	40	47 41	40	47 34	39	47 27	39	20 57
6	47 22	41	47 15	40	47 8	40	47 1	39	46 55	40	46 48	40	54
9	46 41	41	46 35	41	46 28	41	46 22	41	46 15	41	46 8	40	51
3 12	−46 0	41	−45 54	42	−45 47	41	−45 41	41	−45 34	41	−45 28	41	20 48
15	45 19	42	45 12	42	45 6	42	45 0	42	44 53	41	44 47	41	45
18	44 37	42	44 30	42	44 24	42	44 18	41	44 12	42	44 6	42	42
21	43 55	43	43 48	42	43 42	42	43 37	43	43 30	42	43 24	42	39
24	43 12	43	43 6	43	43 0	43	42 54	42	42 48	43	42 42	43	36
3 27	−42 29	43	−42 23	43	−42 17	43	−42 12	44	−42 5	43	−41 59	43	20 33
30	41 46	44	41 40	44	41 34	44	41 28	43	41 22	43	41 16	43	30
33	41 2	44	40 56	44	40 50	44	40 45	44	40 39	44	40 33	44	27
36	40 18	45	40 12	45	40 6	45	40 1	45	39 55	44	39 49	44	24
39	39 33	45	39 27	45	39 21	45	39 16	45	39 11	45	39 5	45	21
3 42	−38 48	46	−38 42	45	−38 36	45	−38 31	45	−38 26	45	−38 20	45	20 18
45	38 2	46	37 57	46	37 51	46	37 46	46	37 41	46	37 35	45	15
48	37 16	46	37 11	46	37 5	46	37 0	46	36 55	46	36 50	46	12
51	36 30	47	36 25	47	36 19	46	36 14	46	36 9	46	36 4	46	9
54	35 43	47	35 38	47	35 33	47	35 28	47	35 23	47	35 18	47	6
3 57	−34 56	47	−34 51	47	−34 46	47	−34 41	47	−34 36	47	−34 31	47	20 3
4 0	34 9	48	34 4	48	33 59	48	33 54	47	33 49	47	33 44	47	20 0
3	33 21	48	33 16	48	33 11	48	33 7	48	33 2	48	32 57	47	19 57
6	32 33	49	32 28	48	32 23	48	32 19	48	32 14	48	32 10	48	54
4 9	−31 44		−31 40		−31 35		−31 31		−31 26		−31 22		19 51

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1914.

Decl. H. A.	88° 50′ 40″		88° 50′ 50″		88° 51′ 0″		88° 51′ 10″		88° 51′ 20″		88° 51′ 30″		Decl. H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
4 9	−31 44	49	−31 40	49	−31 35	49	−31 31	49	−31 26	48	−31 22	48	19 51
12	30 55	49	30 51	49	30 46	48	30 42	48	30 38	49	30 34	49	48
15	30 6	50	30 2	49	29 58	49	29 54	49	29 49	49	29 45	49	45
18	29 16	50	29 13	50	29 9	50	29 5	50	29 0	49	28 56	49	42
21	28 26	50	28 23	50	28 19	50	28 15	49	28 11	49	28 7	49	39
4 24	−27 36	50	−27 33	51	−27 29	50	−27 26	50	−27 22	50	−27 18	50	19 36
27	26 46	50	26 42	50	26 39	51	26 36	51	26 32	50	26 28	50	33
30	25 56	51	25 52	51	25 48	50	25 45	50	25 42	51	25 38	50	30
33	25 5	51	25 1	51	24 58	51	24 55	51	24 51	50	24 48	51	27
36	24 14	51	24 10	51	24 7	51	24 4	51	24 1	51	23 57	50	24
4 39	−23 23	52	−23 19	52	−23 16	52	−23 13	51	−23 10	51	−23 7	51	19 21
42	22 31	52	22 27	51	22 24	51	22 22	51	22 19	52	22 16	51	18
45	21 39	52	21 36	52	21 33	52	21 31	52	21 27	51	21 25	52	15
48	20 47	52	20 44	52	20 41	52	20 39	52	20 36	52	20 33	51	12
51	19 55	52	19 52	52	19 49	52	19 47	52	19 44	52	19 42	52	9
4 54	−19 3	52	−19 0	52	−18 57	52	−18 55	52	−18 52	52	−18 50	52	19 6
4 57	18 11	53	18 8	53	18 5	53	18 3	53	18 0	52	17 58	52	3
5 0	17 18	53	17 15	53	17 12	52	17 10	52	17 8	52	17 6	53	19 0
3	16 25	53	16 22	53	16 20	53	16 18	53	16 16	53	16 13	52	18 57
6	15 32	53	15 29	53	15 27	53	15 25	53	15 23	53	15 21	53	54
5 9	−14 39	53	−14 36	53	−14 34	53	−14 32	53	−14 30	53	−14 28	52	18 51
12	13 46	54	13 43	53	13 41	53	13 39	53	13 37	53	13 36	53	48
15	12 52	54	12 50	54	12 48	54	12 46	53	12 44	53	12 43	53	45
18	11 58	54	11 56	54	11 54	54	11 53	54	11 51	53	11 50	54	42
21	11 4	54	11 2	54	11 0	53	10 59	53	10 58	54	10 56	53	39
5 24	−10 10	54	−10 8	54	−10 7	54	−10 6	54	−10 4	53	−10 3	53	18 36
27	9 16	54	9 14	53	9 13	54	9 12	54	9 11	54	9 10	54	33
30	8 22	54	8 21	54	8 19	53	8 18	53	8 17	53	8 16	53	30
33	7 28	54	7 27	54	7 26	54	7 25	54	7 24	54	7 23	54	27
36	6 34	54	6 33	54	6 32	54	6 31	54	6 30	54	6 29	54	24
5 39	− 5 40	55	− 5 39	55	− 5 38	55	− 5 37	54	− 5 36	54	− 5 35	53	18 21
42	4 45	55	4 44	55	4 43	54	4 43	54	4 42	54	4 42	54	18
45	3 50	54	3 49	54	3 49	54	3 49	54	3 48	53	3 48	54	15
48	2 56	55	2 55	54	2 55	54	2 55	54	2 55	54	2 54	53	12
51	2 1	55	2 1	55	2 1	55	2 1	54	2 1	54	2 1	54	9
5 54	− 1 6	54	− 1 6	54	− 1 6	54	− 1 7	54	− 1 7	54	− 1 7	54	18 6
5 57	− 0 12	54	− 0 12	54	− 0 12	54	− 0 13	54	− 0 13	54	− 0 13	54	3
6 0	+ 0 42	54	+ 0 42	54	+ 0 42	53	+ 0 41	54	+ 0 41	54	+ 0 41	54	18 0
3	1 36	54	1 36	54	1 35	54	1 35	54	1 35	54	1 35	53	17 57
6	2 30	55	2 30	54	2 29	55	2 29	54	2 29	54	2 28	54	54
6 9	+ 3 25	54	+ 3 24	54	+ 3 24	54	+ 3 23	54	+ 3 23	54	+ 3 22	54	17 51
12	4 19	55	4 18	55	4 18	54	4 17	54	4 17	53	4 16	53	48
15	5 14	54	5 13	54	5 12	54	5 11	54	5 10	54	5 9	54	45
18	6 8	54	6 7	54	6 6	54	6 5	54	6 4	54	6 3	53	42
21	7 2	54	7 1	54	7 0	54	6 59	54	6 58	53	6 56	54	39
6 24	+ 7 56	54	+ 7 55	54	+ 7 54	53	+ 7 53	53	+ 7 51	54	+ 7 50	53	17 36
27	8 50	54	8 49	54	8 47	54	8 46	54	8 45	53	8 43	54	33
30	9 44	54	9 43	54	9 41	54	9 40	53	9 38	54	9 37	53	30
33	10 38	54	10 37	53	10 35	53	10 33	53	10 32	53	10 30	53	27
36	11 32	54	11 30	54	11 28	54	11 26	54	11 25	53	11 23	53	24
6 39	+12 26	54	+12 24	54	+12 22	54	+12 20	53	+12 18	52	+12 16	52	17 21
42	13 20	53	13 18	53	13 16	53	13 13	53	13 10	53	13 8	53	18
45	14 13	53	14 11	53	14 9	52	14 6	52	14 3	53	14 1	53	15
48	15 6	53	15 4	53	15 1	53	14 58	53	14 56	52	14 54	52	12
51	15 59	53	15 57	52	15 54	52	15 51	53	15 48	53	15 46	52	9
6 54	+16 52	52	+16 49	52	+16 46	52	+16 44	52	+16 41	52	+16 38	52	17 6
6 57	17 44	52	17 41	52	17 38	52	17 36	52	17 33	52	17 30	52	3
7 0	18 36	52	18 33	52	18 30	52	18 28	52	18 25	51	18 22	52	17 0
3	19 28	52	19 25	52	19 22	52	19 20	51	19 16	52	19 14	51	16 57
7 6	+20 20		+20 17		+20 14		+20 11		+20 8		+20 5		16 54

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 19

H. A. \ Decl.	88° 50′ 40″		88° 50′ 50″		88° 51′ 0″		88° 51′ 10″		88° 51′ 20″		88° 51′ 30″		Decl. / H.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
7 6	+20 20	52	+20 17	52	+20 14	52	+20 11	52	+20 8	51	+20 5	51	16 54
9	21 12	52	21 9	52	21 6	51	21 3	51	20 59	51	20 56	51	51
12	22 4	51	22 1	51	21 57	51	21 54	51	21 50	51	21 47	51	48
15	22 55	51	22 52	51	22 48	51	22 45	51	22 41	51	22 38	50	45
18	23 46	51	23 43	51	23 39	51	23 36	50	23 32	50	23 28	51	42
7 21	+24 37	51	+24 34	50	+24 30	50	+24 26	50	+24 22	50	+24 19	50	16 39
24	25 28	50	25 24	50	25 20	50	25 16	50	25 12	50	25 9	49	36
27	26 18	50	26 14	50	26 10	50	26 6	50	26 2	50	25 58	50	33
30	27 8	50	27 4	49	27 0	49	26 56	49	26 52	49	26 48	49	30
33	27 58	49	27 53	49	27 49	49	27 45	49	27 41	49	27 37	49	27
7 36	+28 47	49	+28 42	49	+28 38	49	+28 34	49	+28 30	49	+28 26	48	16 24
39	29 36	49	29 31	49	29 27	49	29 23	49	29 19	48	29 14	49	21
42	30 25	49	30 20	49	30 16	48	30 12	48	30 7	48	30 3	48	18
45	31 14	48	31 9	48	31 4	48	31 0	48	30 55	48	30 51	47	15
48	32 2	48	31 57	48	31 52	48	31 48	48	31 43	48	31 38	48	12
7 51	+32 50	47	+32 45	47	+32 40	47	+32 36	47	+32 31	47	+32 26	47	16 9
54	33 37	47	33 32	47	33 27	47	33 23	47	33 18	47	33 13	46	6
7 57	34 24	47	34 19	47	34 14	47	34 10	46	34 5	46	33 59	47	3
8 0	35 11	47	35 6	47	35 1	46	34 56	46	34 51	46	34 46	46	16 0
3	35 58	46	35 53	46	35 47	46	35 42	46	35 37	46	35 32	45	15 57
8 6	+36 44	46	+36 39	46	+36 33	46	+36 28	46	+36 23	45	+36 17	45	15 54
9	37 30	46	37 25	45	37 19	45	37 14	45	37 8	45	37 2	45	51
12	38 16	45	38 10	45	38 4	45	37 59	44	37 53	44	37 47	45	48
15	39 1	44	38 55	44	38 49	44	38 43	45	38 37	45	38 32	44	45
18	39 45	44	39 39	44	39 33	44	39 28	43	39 22	43	39 16	43	42
8 21	+40 29	44	+40 23	43	+40 17	43	+40 11	44	+40 5	44	+39 59	44	15 39
24	41 13	43	41 6	43	41 0	43	40 55	43	40 49	43	40 43	43	36
27	41 56	43	41 49	43	41 43	43	41 38	42	41 32	42	41 26	42	33
30	42 39	42	42 32	42	42 26	42	42 20	43	42 14	42	42 8	42	30
33	43 21	42	43 14	42	43 8	42	43 3	41	42 56	42	42 50	41	27
8 36	+44 3	42	+43 56	42	+43 50	42	+43 44	42	+43 38	41	+43 31	41	15 24
39	44 45	41	44 38	41	44 32	40	44 26	40	44 19	41	44 12	41	21
42	45 26	41	45 19	41	45 12	41	45 6	41	45 0	40	44 53	40	18
45	46 7	40	46 0	40	45 53	40	45 47	40	45 40	40	45 33	40	15
48	46 47	40	46 40	40	46 33	40	46 27	39	46 20	39	46 13	39	12
8 51	+47 27	39	+47 20	39	+47 13	39	+47 6	39	+46 59	39	+46 52	39	15 9
54	48 6	39	47 59	39	47 52	38	47 45	38	47 38	38	47 31	38	6
8 57	48 45	38	48 38	38	48 30	38	48 23	38	48 16	38	48 9	38	3
9 0	49 23	38	49 16	37	49 8	38	49 1	38	48 54	37	48 47	37	15 0
3	50 1	37	49 53	37	49 46	37	49 39	37	49 31	37	49 24	37	14 57
9 6	+50 38	37	+50 30	36	+50 23	36	+50 16	36	+50 8	36	+50 1	36	14 54
9	51 15	36	51 6	36	50 59	36	50 52	36	50 44	36	50 37	36	51
12	51 51	35	51 42	36	51 35	35	51 28	35	51 20	35	51 13	35	48
15	52 26	35	52 18	35	52 10	35	52 3	35	51 55	35	51 48	35	45
18	53 1	35	52 53	34	52 45	34	52 38	34	52 30	34	52 23	34	42
9 21	+53 36	34	+53 27	34	+53 19	34	+53 12	34	+53 4	34	+52 57	33	14 39
24	54 10	33	54 1	33	53 53	33	53 46	33	53 38	33	53 30	33	36
27	54 43	33	54 34	33	54 26	33	54 19	33	54 11	33	54 3	33	33
30	55 16	33	55 7	33	54 59	33	54 52	32	54 44	32	54 36	32	30
33	55 49	32	55 40	32	55 32	32	55 24	32	55 16	31	55 8	31	27
9 36	+56 21	31	+56 12	31	+56 4	31	+55 56	31	+55 47	31	+55 39	31	14 24
39	56 52	31	56 43	31	56 35	30	56 27	30	56 18	31	56 10	30	21
42	57 23	30	57 14	30	57 5	30	56 57	30	56 49	30	56 40	30	18
45	57 53	29	57 44	29	57 35	29	57 27	29	57 19	29	57 10	29	15
48	58 22	29	58 13	29	58 4	29	57 56	29	57 48	28	57 39	29	12
9 51	+58 51	28	+58 42	28	+58 33	28	+58 25	28	+58 16	28	+58 8	28	14 9
54	59 19	27	59 10	27	59 1	27	58 53	27	58 44	28	58 36	27	6
9 57	59 46	27	59 37	27	59 28	27	59 20	27	59 12	27	59 3	27	3
10 0	60 13	26	60 4	26	59 55	26	59 47	26	59 39	26	59 30	26	14 0
10 3	+60 39		+60 30		+60 21		+60 13		+60 5		+59 56		13 57

TABLE I.

OR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1914.

Decl. / A.	88° 50′ 40″		88° 50′ 50″		88° 51′ 0″		88° 51′ 10″		88° 51′ 20″		88° 51′ 30″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
10 3	+60 39	26	+60 30	26	+60 21	26	+60 13	26	+60 5	25	+59 56	25	13 57
6	61 5	25	60 56	25	60 47	25	60 39	25	60 30	25	60 21	25	54
9	61 30	25	61 21	25	61 12	25	61 4	24	60 55	24	60 46	24	51
12	61 55	24	61 46	24	61 37	24	61 28	24	61 19	24	61 10	24	48
15	62 19	23	62 10	23	62 1	23	61 52	23	61 43	23	61 34	23	45
10 18	+62 42	23	+62 33	23	+62 24	23	+62 15	23	+62 6	23	+61 57	22	13 42
21	63 5	22	62 56	22	62 47	22	62 38	22	62 29	22	62 19	22	39
24	63 27	21	63 18	21	63 9	21	63 0	21	62 51	21	62 41	21	36
27	63 48	21	63 39	21	63 30	21	63 21	21	63 12	21	63 2	21	33
30	64 9	20	64 0	20	63 51	20	63 42	20	63 33	20	63 23	20	30
10 33	+64 29	20	+64 20	20	+64 11	19	+64 2	19	+63 53	19	+63 43	19	13 27
36	64 49	19	64 40	19	64 30	19	64 21	19	64 12	18	64 2	19	24
39	65 8	18	64 59	18	64 49	18	64 40	18	64 30	18	64 21	18	21
42	65 26	18	65 17	18	65 7	18	64 58	17	64 48	17	64 39	17	18
45	65 44	17	65 35	17	65 25	17	65 15	17	65 5	17	64 56	17	15
10 48	+66 1	16	+65 52	16	+65 42	16	+65 32	16	+65 22	16	+65 13	16	13 12
51	66 17	15	66 8	15	65 58	15	65 48	15	65 38	15	65 29	15	9
54	66 32	15	66 23	15	66 13	15	66 3	15	65 53	15	65 44	15	6
10 57	66 47	14	66 38	14	66 28	14	66 18	14	66 8	14	65 59	14	3
11 0	67 1	14	66 52	13	66 42	13	66 32	13	66 22	13	66 13	13	13 0
11 3	+67 15	13	+67 5	13	+66 55	13	+66 45	13	+66 35	13	+66 26	13	12 57
6	67 28	12	67 18	12	67 8	12	66 58	12	66 48	12	66 39	12	54
9	67 40	11	67 30	11	67 20	11	67 10	12	67 0	12	66 51	11	51
12	67 51	11	67 41	11	67 31	11	67 22	10	67 12	11	67 2	11	48
15	68 2	10	67 52	10	67 42	10	67 32	10	67 23	10	67 13	10	45
11 18	+68 12	9	+68 2	9	+67 52	9	+67 42	10	+67 33	9	+67 23	9	12 42
21	68 21	9	68 11	9	68 1	9	67 52	8	67 42	8	67 32	8	39
24	68 30	8	68 20	8	68 10	8	68 0	8	67 50	8	67 40	8	36
27	68 38	7	68 28	7	68 18	7	68 8	7	67 58	7	67 48	7	33
30	68 45	7	68 35	7	68 25	7	68 15	7	68 5	7	67 55	7	30
11 33	+68 52	6	+68 42	6	+68 32	6	+68 22	6	+68 12	6	+68 2	6	12 27
36	68 58	5	68 48	5	68 38	5	68 28	5	68 18	5	68 8	5	24
39	69 3	4	68 53	4	68 43	4	68 33	5	68 23	5	68 13	4	21
42	69 7	4	68 57	4	68 47	4	68 38	3	68 28	4	68 17	4	18
45	69 11	3	69 1	3	68 51	3	68 41	3	68 32	3	68 21	3	15
11 48	+69 14	2	+69 4	2	+68 54	2	+68 44	3	+68 35	2	+68 24	3	12 12
51	69 16	2	69 6	2	68 56	2	68 47	2	68 37	2	68 27	2	9
54	69 18	1	69 8	1	68 58	1	68 49	0	68 39	1	68 29	1	6
11 57	69 19	1	69 9	1	68 59	1	68 49	1	68 40	0	68 30	0	3
12 0	+69 20		+69 10		+69 0		+68 50		+68 40		+68 30		12 0

TABLE Ia.

Table I has been computed for an altitude of 45°. For other altitudes, corrections taken m the following table may be applied when the desired degree of accuracy requires it.

H. A.	Altitude.	10°	20°	30°	40°	50°	60°	70°	Altitude.	H. A.
h	h	″	″	″	″	″	″	″	h	h
0	12	0	0	0	0	0	0	0	12	24
1	11	− 3	− 2	− 2	−1	0	+ 2	+ 5	13	23
2	10	9	7	5	2	+2	8	18	14	22
3	9	17	13	9	4	4	16	36	15	21
4	8	26	20	13	5	6	24	55	16	20
5	7	32	25	16	7	8	28	68	17	19
6	6	−35	−27	−18	−7	+8	+30	+73	18	18

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.00
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.00
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.00
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.00
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.01
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.01
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.01
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.01
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.02
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.02
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.02
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.03
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.03
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.03
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.03
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.04
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.04
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.04
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.04
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.05
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.05
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.05
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.06
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.06
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.06
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Sidereal.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	8^{h}	9^{h}	10^{h}	11^{h}	12^{h}	13^{h}	14^{h}	15^{h}	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42 391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Sidereal.	8^{h}	9^{h}	10^{h}	11^{h}	12^{h}	13^{h}	14^{h}	15^{h}	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Second	
s	m s	m s	m s	m s	m s	m s	m s	s	s
37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.0
37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.0
37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.0
37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.0
37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.0
38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.0
38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.0
38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.0
38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.0
38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.0
38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.0
39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.0
39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.0
39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.0
39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.0
39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.0
39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.0
40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.0
40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.0
40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.0
40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.0
40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.0
40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.0
41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.0
41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.0
41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.0
41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.07
41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.07
41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.07
42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.07
42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.08
42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.08
42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.08
42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.09
42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.09
43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.09
43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.09
43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.10
43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.10
43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.10
43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.10
43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.11
44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.11
44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.11
44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.12
44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.12
44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.12
44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.12
45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.13
45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.13
45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162
Mean Solar.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8^{h}	9^{h}	10^{h}	11^{h}	12^{h}	13^{h}	14^{h}	15^{h}	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.00
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.00
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.00
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.00
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.01
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.01
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.01
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.01
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.02
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.02
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.02
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.03
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.03
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.03
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.03
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.04
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.04
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.04
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.04
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.05
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.05
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.05
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.06
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.06
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.06
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.06
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.07
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.07
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.07
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.07
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.08
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.08
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.08
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.09
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.09
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	8^{h}	9^{h}	10^{h}	11^{h}	12^{h}	13^{h}	14^{h}	15^{h}	For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Seconds.	

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1914.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of nor

Lat. / H. A.	10°	15°	20°	25°	30°	35°	40°	45°	50°	Lat. / H
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24
12	0 3.7	0 3.7	0 3.8	0 4.0	0 4.2	0 4.5	0 4.8	0 5.2	0 5.7	23 4
24	0 7.3	0 7.5	0 7.8	0 8.1	0 8.4	0 8.9	0 9.6	0 10.4	0 11.5	3
36	0 11.0	0 11.3	0 11.6	0 12.0	0 12.6	0 13.4	0 14.3	0 15.5	0 17.2	2
48	0 14.7	0 14.9	0 15.3	0 15.9	0 16.8	0 17.7	0 19.0	0 20.7	0 22.8	1
1 0	0 18.2	0 18.6	0 19.1	0 19.9	0 20.8	0 22.0	0 23.7	0 25.7	0 28.4	23
12	0 21.7	0 22.2	0 22.9	0 23.7	0 24.9	0 26.3	0 28.2	0 30.7	0 33.9	22 4
24	0 25.2	0 25.7	0 26.5	0 27.5	0 28.8	0 30.6	0 32.7	0 35.5	0 39.2	3
36	0 28.6	0 29.1	0 30.0	0 31.2	0 32.7	0 34.6	0 37.2	0 40.4	0 44.5	2
48	0 31.9	0 32.6	0 33.5	0 34.8	0 36.5	0 38.7	0 41.5	0 45.1	0 49.7	1
2 0	0 35.1	0 35.9	0 36.9	0 38.3	0 40.2	0 42.6	0 45.7	0 49.6	0 54.7	22
12	0 38.2	0 39.1	0 40.2	0 41.7	0 43.8	0 46.3	0 49.7	0 54.0	0 59.6	21 4
24	0 41.2	0 42.2	0 43.4	0 45.0	0 47.2	0 50.0	0 53.6	0 58.2	1 4.2	3
36	0 44.2	0 45.1	0 46.5	0 48.2	0 50.6	0 53.6	0 57.3	1 2.4	1 8.8	2
48	0 46.9	0 48.0	0 49.4	0 51.3	0 53.8	0 56.9	1 1.0	1 6.2	1 13.1	1
3 0	0 49.6	0 50.7	0 52.2	0 54.2	0 56.8	1 0.1	1 4.4	1 9.9	1 17.1	21
12	0 52.1	0 53.2	0 54.8	0 56.9	0 59.7	1 3.1	1 7.6	1 13.5	1 21.0	20 4
24	0 54.5	0 55.7	0 57.3	0 59.4	1 2.4	1 6.0	1 10.6	1 16.8	1 24.6	3
36	0 56.7	0 58.0	0 59.6	1 1.8	1 4.8	1 8.7	1 13.5	1 19.8	1 28.0	2
48	0 58.8	1 0.1	1 1.7	1 4.1	1 7.2	1 11.1	1 16.2	1 22.7	1 31.1	1
4 0	1 0.7	1 2.0	1 3.7	1 6.2	1 9.4	1 13.4	1 18.6	1 25.3	1 34.0	20
12	1 2.5	1 3.8	1 5.6	1 8.1	1 11.3	1 15.5	1 20.8	1 27.7	1 36.6	19 4
24	1 4.1	1 5.3	1 7.2	1 9.8	1 13.0	1 17.3	1 22.8	1 29.8	1 38.9	3
36	1 5.5	1 6.7	1 8.7	1 11.2	1 14.6	1 19.0	1 24.5	1 31.6	1 40.9	2
48	1 6.7	1 8.0	1 10.0	1 12.5	1 16.0	1 20.4	1 26.0	1 33.3	1 42.7	1
5 0	1 7.7	1 9.1	1 11.0	1 13.6	1 17.1	1 21.6	1 27.3	1 34.7	1 44.2	19
12	1 8.5	1 9.9	1 11.9	1 14.5	1 18.1	1 22.5	1 28.3	1 35.8	1 45.5	18 4
24	1 9.1	1 10.6	1 12.6	1 15.2	1 18.8	1 23.3	1 29.1	1 36.6	1 46.4	3
36	1 9.6	1 11.0	1 13.1	1 15.7	1 19.3	1 23.8	1 29.7	1 37.2	1 47.0	2
48	1 9.9	1 11.3	1 13.3	1 16.0	1 19.5	1 24.1	1 30.0	1 37.5	1 47.3	1
6 0	1 10.0	1 11.4	1 13.4	1 16.1	1 19.6	1 24.2	1 30.0	1 37.5	1 47.4	18 0
12	1 9.9	1 11.3	1 13.3	1 16.0	1 19.5	1 24.0	1 29.8	1 37.3	1 47.1	17 48
24	1 9.6	1 11.0	1 12.9	1 15.5	1 19.1	1 23.6	1 29.3	1 36.8	1 46.4	36
36	1 9.1	1 10.4	1 12.4	1 15.0	1 18.5	1 22.9	1 28.7	1 36.0	1 45.5	24
48	1 8.4	1 9.7	1 11.7	1 14.3	1 17.7	1 22.1	1 27.7	1 35.0	1 44.5	12
7 0	1 7.5	1 8.9	1 10.8	1 13.3	1 16.7	1 21.0	1 26.5	1 33.7	1 43.0	17 0
12	1 6.5	1 7.8	1 9.6	1 12.1	1 15.4	1 19.7	1 25.2	1 32.1	1 41.2	16 48
24	1 5.3	1 6.5	1 8.3	1 10.8	1 14.0	1 18.2	1 23.5	1 30.4	1 39.3	36
36	1 3.9	1 5.1	1 6.8	1 9.2	1 12.4	1 16.5	1 21.6	1 28.4	1 37.1	24
48	1 2.3	1 3.4	1 5.2	1 7.5	1 10.5	1 14.5	1 19.6	1 26.1	1 34.6	12
8 0	1 0.5	1 1.6	1 3.3	1 5.6	1 8.6	1 12.4	1 17.2	1 23.6	1 31.8	16 0
12	0 58.6	0 59.7	1 1.3	1 3.5	1 6.4	1 10.1	1 14.8	1 20.9	1 28.8	15 48
24	0 56.5	0 57.6	0 59.1	1 1.2	1 4.0	1 7.5	1 12.1	1 18.0	1 25.6	36
36	0 54.3	0 55.3	0 56.7	0 58.8	1 1.4	1 4.8	1 9.2	1 14.8	1 22.1	24
48	0 51.9	0 52.8	0 54.2	0 56.1	0 58.7	1 1.9	1 6.1	1 11.5	1 18.4	12
9 0	0 49.4	0 50.3	0 51.6	0 53.4	0 55.8	0 58.9	1 2.8	1 7.9	1 14.5	15 0
12	0 46.7	0 47.6	0 48.8	0 50.5	0 52.8	0 55.7	0 59.4	1 4.2	1 10.5	14 48
24	0 44.0	0 44.7	0 45.9	0 47.6	0 49.6	0 52.4	0 55.9	1 0.4	1 6.2	36
36	0 41.0	0 41.8	0 42.9	0 44.4	0 46.4	0 48.9	0 52.2	0 56.4	1 1.8	24
48	0 38.0	0 38.7	0 39.8	0 41.1	0 43.0	0 45.3	0 48.3	0 52.2	0 57.2	12
10 0	0 34.9	0 35.5	0 36.5	0 37.7	0 39.4	0 41.6	0 44.3	0 47.9	0 52.5	14 0
12	0 31.7	0 32.2	0 33.1	0 34.2	0 35.7	0 37.7	0 40.3	0 43.5	0 47.7	13 48
24	0 28.4	0 28.9	0 29.6	0 30.6	0 32.0	0 33.8	0 36.0	0 39.0	0 42.7	36
36	0 25.0	0 25.5	0 26.1	0 27.0	0 28.2	0 29.8	0 31.7	0 34.3	0 37.6	24
48	0 21.5	0 22.0	0 22.5	0 23.3	0 24.3	0 25.7	0 27.4	0 29.5	0 32.3	12
11 0	0 18.0	0 18.4	0 18.8	0 19.5	0 20.4	0 21.5	0 22.9	0 24.7	0 27.1	13 0
12	0 14.5	0 14.7	0 15.1	0 15.7	0 16.4	0 17.3	0 18.4	0 19.9	0 21.8	12 48
24	0 11.0	0 11.1	0 11.4	0 11.8	0 12.4	0 13.0	0 13.9	0 14.9	0 16.4	36
36	0 7.3	0 7.5	0 7.6	0 7.9	0 8.2	0 8.7	0 9.2	0 10.0	0 10.9	24
48	0 3.7	0 3.7	0 3.8	0 4.0	0 4.2	0 4.3	0 4.6	0 5.0	0 5.5	12
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1914.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. / H.A.	52°	54°	56°	58°	60°	61°	62°	63°	64°	Lat. / H.A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
12	0 6.0	0 6.3	0 6.7	0 7.0	0 7.4	0 7.7	0 8.0	0 8.2	0 8.5	23 48
24	0 12.0	0 12.6	0 13.3	0 14.0	0 14.9	0 15.4	0 16.0	0 16.5	0 17.1	36
36	0 17.9	0 18.9	0 19.9	0 21.0	0 22.3	0 23.0	0 23.8	0 24.7	0 25.6	24
48	0 23.9	0 25.1	0 26.3	0 27.8	0 29.7	0 30.6	0 31.6	0 32.8	0 34.0	12
1 0	0 29.7	0 31.2	0 32.8	0 34.7	0 36.9	0 38.1	0 39.4	0 40.8	0 42.3	23 0
12	0 35.4	0 37.2	0 39.2	0 41.4	0 44.0	0 45.4	0 47.0	0 48.7	0 50.5	22 48
24	0 41.1	0 43.1	0 45.4	0 48.0	0 51.0	0 52.7	0 54.4	0 56.4	0 58.6	36
36	0 46.6	0 48.9	0 51.5	0 54.4	0 57.9	0 59.7	1 1.7	1 4.0	1 6.4	24
48	0 52.0	0 54.6	0 57.5	1 0.8	1 4.5	1 6.7	1 8.9	1 11.4	1 14.0	12
2 0	0 57.2	1 0.0	1 3.1	1 6.9	1 11.0	1 13.3	1 15.8	1 18.5	1 21.4	22 0
12	1 2.3	1 5.4	1 8.7	1 12.8	1 17.3	1 19.7	1 22.5	1 25.4	1 28.6	21 48
24	1 7.2	1 10.5	1 14.2	1 18.5	1 23.3	1 26.0	1 28.9	1 32.1	1 35.5	36
36	1 11.9	1 15.4	1 19.4	1 24.0	1 29.1	1 32.0	1 35.1	1 38.5	1 42.2	24
48	1 16.3	1 20.1	1 24.3	1 29.2	1 34.7	1 37.7	1 41.1	1 44.6	1 48.5	12
3 0	1 20.6	1 24.5	1 29.0	1 34.1	1 39.9	1 43.2	1 46.7	1 50.4	1 54.5	21 0
12	1 24.6	1 28.8	1 33.4	1 38.8	1 44.9	1 48.3	1 51.9	1 55.9	2 0.1	20 48
24	1 28.4	1 32.8	1 37.6	1 43.3	1 49.6	1 53.0	1 56.8	2 0.9	2 5.5	36
36	1 32.0	1 36.5	1 41.5	1 47.3	1 53.8	1 57.5	2 1.5	2 5.7	2 10.4	24
48	1 35.2	1 39.9	1 45.1	1 51.0	1 57.8	2 1.5	2 5.6	2 10.1	2 14.8	12
4 0	1 38.2	1 43.0	1 48.4	1 54.5	2 1.5	2 5.3	2 9.6	2 14.1	2 19.0	20 0
12	1 41.0	1 45.8	1 51.3	1 57.7	2 4.8	2 8.8	2 13.0	2 17.7	2 22.8	19 48
24	1 43.4	1 48.4	1 54.0	2 0.5	2 7.8	2 11.8	2 16.2	2 21.0	2 26.1	36
36	1 45.6	1 50.6	1 56.3	2 2.8	2 10.3	2 14.4	2 18.9	2 23.8	2 29.1	24
48	1 47.3	1 52.5	1 58.3	2 4.9	2 12.5	2 16.7	2 21.2	2 26.2	2 31.5	12
5 0	1 48.8	1 54.1	2 0.0	2 6.8	2 14.4	2 18.7	2 23.2	2 28.2	2 33.6	19 0
12	1 50.1	1 55.4	2 1.3	2 8.1	2 15.9	2 20.2	2 24.7	2 29.8	2 35.1	18 48
24	1 51.0	1 56.4	2 2.3	2 9.1	2 16.9	2 21.3	2 25.9	2 30.9	2 36.3	36
36	1 51.6	1 57.0	2 3.0	2 9.8	2 17.6	2 22.0	2 26.7	2 31.6	2 37.0	24
48	1 51.9	1 57.3	2 3.3	2 10.1	2 17.9	2 22.3	2 27.0	2 32.0	2 37.3	12
6 0	1 52.0	1 57.3	2 3.3	2 10.1	2 17.9	2 22.2	2 26.9	2 31.9	2 37.3	18 0
12	1 51.7	1 57.0	2 2.9	2 9.7	2 17.5	2 21.7	2 26.4	2 31.4	2 36.7	17 48
24	1 51.0	1 56.4	2 2.2	2 9.0	2 16.6	2 21.0	2 25.5	2 30.4	2 35.7	36
36	1 50.1	1 55.4	2 1.1	2 7.9	2 15.4	2 19.7	2 24.3	2 29.1	2 34.3	24
48	1 48.9	1 54.0	1 59.8	2 6.5	2 13.9	2 18.1	2 22.5	2 27.4	2 32.5	12
7 0	1 47.4	1 52.4	1 58.2	2 4.6	2 12.0	2 16.1	2 20.5	2 25.2	2 30.3	17 0
12	1 45.7	1 50.5	1 56.1	2 2.5	2 9.7	2 13.7	2 18.0	2 22.6	2 27.7	16 48
24	1 43.6	1 48.4	1 53.8	2 0.0	2 7.1	2 11.0	2 15.3	2 19.8	2 24.7	36
36	1 41.2	1 46.0	1 51.2	1 57.4	2 4.2	2 8.0	2 12.2	2 16.6	2 21.3	24
48	1 38.6	1 43.2	1 48.3	1 54.3	2 0.9	2 4.6	2 8.6	2 12.9	2 17.6	12
8 0	1 35.8	1 40.2	1 45.2	1 50.9	1 57.3	2 0.9	2 4.8	2 8.9	2 13.4	16 0
12	1 32.6	1 36.9	1 41.7	1 47.2	1 53.4	1 56.9	2 0.6	2 4.7	2 9.0	15 48
24	1 29.2	1 33.3	1 38.0	1 43.3	1 49.2	1 52.7	1 56.2	2 0.0	2 4.2	36
36	1 25.6	1 29.6	1 34.0	1 39.1	1 44.8	1 48.0	1 51.4	1 55.1	1 59.1	24
48	1 21.8	1 25.6	1 29.8	1 34.6	1 40.1	1 43.1	1 46.3	1 49.9	1 53.7	12
9 0	1 17.8	1 21.3	1 25.4	1 29.9	1 35.1	1 38.0	1 41.1	1 44.4	1 48.1	15 0
12	1 13.5	1 16.9	1 20.7	1 25.0	1 29.9	1 32.5	1 35.5	1 38.6	1 42.1	14 48
24	1 9.1	1 12.2	1 15.8	1 19.8	1 24.4	1 27.0	1 29.7	1 32.7	1 35.8	36
36	1 4.4	1 7.4	1 10.8	1 14.5	1 18.7	1 21.2	1 23.7	1 26.4	1 29.3	24
48	0 59.7	1 2.4	1 5.4	1 9.0	1 12.9	1 15.1	1 17.5	1 20.0	1 22.7	12
10 0	0 54.8	0 57.2	0 59.9	1 3.3	1 6.8	1 8.9	1 11.0	1 13.3	1 15.8	14 0
12	0 49.7	0 52.0	0 54.5	0 57.4	1 0.7	1 2.5	1 4.5	1 6.6	1 8.8	13 48
24	0 44.4	0 46.5	0 48.8	0 51.4	0 54.3	0 55.9	0 57.7	0 59.6	1 1.6	36
36	0 39.1	0 40.9	0 43.0	0 45.2	0 47.8	0 49.3	0 50.8	0 52.4	0 54.2	24
48	0 33.8	0 35.2	0 37.0	0 39.0	0 41.2	0 42.4	0 43.8	0 45.1	0 46.7	12
11 0	0 28.3	0 29.5	0 31.0	0 32.6	0 34.5	0 35.5	0 36.6	0 37.8	0 39.1	13 0
12	0 22.7	0 23.7	0 24.9	0 26.2	0 27.7	0 28.6	0 29.4	0 30.4	0 31.4	12 48
24	0 17.1	0 17.9	0 18.7	0 19.8	0 20.9	0 21.5	0 22.2	0 22.9	0 23.6	36
36	0 11.4	0 12.0	0 12.5	0 13.2	0 13.9	0 14.4	0 14.8	0 15.3	0 15.7	24
48	0 5.8	0 5.9	0 6.3	0 6.6	0 7.0	0 7.2	0 7.4	0 7.6	0 7.9	12
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

AZIMUTH OF POLARIS AT ELONGATION, 1914.

Decl. / Lat.	88° 50′ 40″	88° 50′ 50″	88° 51′ 0″	88° 51′ 10″	88° 51′ 20″	88° 51′ 30″	Variation fo	
							1′ of Lat.	1″
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	
5 0	1 9 35.9	1 9 25.9	1 9 15.8	1 9 5.8	1 8 55.7	1 8 45.7	+0.11	−1
5 20	1 9 38.1	1 9 28.0	1 9 18.0	1 9 8.0	1 8 57.9	1 8 47.9	0.12	1
5 40	1 9 40.4	1 9 30.4	1 9 20.3	1 9 10.3	1 9 0.2	1 8 50.2	0.12	1
6 0	1 9 42.9	1 9 32.9	1 9 22.8	1 9 12.8	1 9 2.7	1 8 52.6	0.13	1
6 20	1 9 45.6	1 9 35.5	1 9 25.4	1 9 15.4	1 9 5.3	1 8 55.2	0.14	1
6 40	1 9 48.3	1 9 38.3	1 9 28.2	1 9 18.1	1 9 8.0	1 8 58.0	+0.14	−1
7 0	1 9 51.2	1 9 41.2	1 9 31.1	1 9 21.0	1 9 10.9	1 9 0.9	0.15	1
7 20	1 9 54.3	1 9 44.2	1 9 34.1	1 9 24.1	1 9 14.0	1 9 3.9	0.16	1
7 40	1 9 57.5	1 9 47.4	1 9 37.3	1 9 27.3	1 9 17.2	1 9 7.1	0.16	1
8 0	1 10 0.9	1 9 50.8	1 9 40.7	1 9 30.6	1 9 20.5	1 9 10.4	0.17	1
8 20	1 10 4.4	1 9 54.3	1 9 44.2	1 9 34.1	1 9 24.0	1 9 13.9	+0.18	−1
8 40	1 10 8.1	1 9 57.9	1 9 47.8	1 9 37.7	1 9 27.6	1 9 17.5	0.18	1
9 0	1 10 11.9	1 10 1.7	1 9 51.6	1 9 41.5	1 9 31.4	1 9 21.2	0.19	1.
9 20	1 10 15.8	1 10 5.7	1 9 55.5	1 9 45.4	1 9 35.3	1 9 25.2	0.20	1.
9 40	1 10 19.9	1 10 9.8	1 9 59.6	1 9 49.5	1 9 39.4	1 9 29.2	0.21	1.
10 0	1 10 24.2	1 10 14.0	1 10 3.8	1 9 53.7	1 9 43.6	1 9 33.4	+0.22	−1.
10 20	1 10 28.6	1 10 18.4	1 10 8.2	1 9 58.1	1 9 47.9	1 9 37.8	0.22	1.
10 40	1 10 33.1	1 10 23.0	1 10 12.8	1 10 2.6	1 9 52.4	1 9 42.3	0.23	1.
11 0	1 10 37.8	1 10 27.7	1 10 17.5	1 10 7.3	1 9 57.1	1 9 46.9	0.24	1.
11 20	1 10 42.7	1 10 32.5	1 10 22.3	1 10 12.1	1 10 1.9	1 9 51.7	0.24	1.
11 40	1 10 47.7	1 10 37.5	1 10 27.3	1 10 17.1	1 10 6.9	1 9 56.7	+0.25	−1.
12 0	1 10 52.9	1 10 42.7	1 10 32.5	1 10 22.3	1 10 12.1	1 10 1.8	0.26	1.
12 20	1 10 58.3	1 10 48.0	1 10 37.8	1 10 27.6	1 10 17.3	1 10 7.1	0.27	1.
12 40	1 11 3.8	1 10 53.5	1 10 43.2	1 10 33.0	1 10 22.8	1 10 12.5	0.28	1.
13 0	1 11 9.4	1 10 59.2	1 10 49.0	1 10 38.7	1 10 28.4	1 10 18.1	0.29	1.
13 20	1 11 15.2	1 11 5.0	1 10 54.7	1 10 44.4	1 10 34.2	1 10 23.9	+0.29	−1.
13 40	1 11 21.2	1 11 10.9	1 11 0.6	1 10 50.4	1 10 40.1	1 10 29.8	0.30	1.
14 0	1 11 27.4	1 11 17.0	1 11 6.7	1 10 56.5	1 10 46.2	1 10 35.8	0.31	1.
14 20	1 11 33.7	1 11 23.3	1 11 13.0	1 11 2.7	1 10 52.4	1 10 42.1	0.32	1.
14 40	1 11 40.1	1 11 29.8	1 11 19.4	1 11 9.1	1 10 58.8	1 10 48.4	0.32	1.
15 0	1 11 46.7	1 11 36.4	1 11 26.0	1 11 15.7	1 11 5.4	1 10 55.0	+0.33	−1.
15 20	1 11 53.5	1 11 43.2	1 11 32.8	1 11 22.5	1 11 12.1	1 11 1.7	0.34	1.
15 40	1 12 0.5	1 11 50.1	1 11 39.7	1 11 29.4	1 11 19.0	1 11 8.6	0.35	1.
16 0	1 12 7.6	1 11 57.2	1 11 46.8	1 11 36.5	1 11 26.1	1 11 15.7	0.36	1.
16 20	1 12 14.9	1 12 4.5	1 11 54.1	1 11 43.7	1 11 33.3	1 11 22.9	0.37	1.
16 40	1 12 22.4	1 12 12.0	1 12 1.5	1 11 51.1	1 11 40.7	1 11 30.3	+0.38	−1.
17 0	1 12 30.1	1 12 19.6	1 12 9.2	1 11 58.7	1 11 48.3	1 11 37.8	0.38	1.
17 20	1 12 37.9	1 12 27.4	1 12 16.9	1 12 6.5	1 11 56.0	1 11 45.5	0.39	1.0
17 40	1 12 45.9	1 12 35.4	1 12 24.9	1 12 14.4	1 12 4.0	1 11 53.5	0.40	1.0
18 0	1 12 54.1	1 12 43.6	1 12 33.1	1 12 22.6	1 12 12.1	1 12 1.5	0.41	1.0
18 20	1 13 2.5	1 12 51.9	1 12 41.4	1 12 30.9	1 12 20.3	1 12 9.8	+0.42	−1.0
18 40	1 13 11.0	1 13 0.5	1 12 50.0	1 12 39.4	1 12 28.8	1 12 18.2	0.43	1.0
19 0	1 13 19.7	1 13 9.2	1 12 58.6	1 12 48.0	1 12 37.4	1 12 26.9	0.44	1.0
19 20	1 13 28.6	1 13 18.0	1 13 7.4	1 12 56.8	1 12 46.2	1 12 35.6	0.45	1.0
19 40	1 13 37.7	1 13 27.1	1 13 16.5	1 13 5.9	1 12 55.3	1 12 44.6	0.46	1.0
20 0	1 13 47.0	1 13 36.4	1 13 25.7	1 13 15.1	1 13 4.4	1 12 53.8	+0.47	−1.0
20 20	1 13 56.5	1 13 45.8	1 13 35.2	1 13 24.5	1 13 13.8	1 13 3.2	0.48	1.0
20 40	1 14 6.1	1 13 55.4	1 13 44.7	1 13 34.1	1 13 23.4	1 13 12.7	0.49	1.0
21 0	1 14 16.0	1 14 5.3	1 13 54.6	1 13 43.9	1 13 33.2	1 13 22.5	0.50	1.0
21 20	1 14 26.0	1 14 15.3	1 14 4.6	1 13 53.9	1 13 43.1	1 13 32.4	0.51	1.0
21 40	1 14 36.3	1 14 25.5	1 14 14.7	1 14 4.0	1 13 53.3	1 13 42.5	+0.52	−1.0
22 0	1 14 46.7	1 14 36.0	1 14 25.2	1 14 14.4	1 14 3.6	1 13 52.8	0.53	1.0
22 20	1 14 57.4	1 14 46.6	1 14 35.8	1 14 25.0	1 14 14.2	1 14 3.4	0.54	1.0
22 40	1 15 8.2	1 14 57.4	1 14 46.5	1 14 35.7	1 14 24.9	1 14 14.1	0.55	1.0
23 0	1 15 19.3	1 15 8.4	1 14 57.5	1 14 46.7	1 14 35.9	1 14 25.0	0.56	1.09
23 20	1 15 30.6	1 15 19.7	1 15 8.8	1 14 57.9	1 14 47.0	1 14 36.1	+0.57	−1.09
23 40	1 15 42.0	1 15 31.1	1 15 20.2	1 15 9.3	1 14 58.4	1 14 47.5	0.58	1.09
24 0	1 15 53.7	1 15 42.8	1 15 31.8	1 15 20.9	1 15 10.0	1 14 59.0	0.59	1.09
24 20	1 16 5.6	1 15 54.7	1 15 43.7	1 15 32.7	1 15 21.8	1 15 10.8	0.60	1.10
24 40	1 16 17.7	1 16 6.8	1 15 55.8	1 15 44.8	1 15 33.8	1 15 22.8	0.61	1.10
25 0	1 16 30.1	1 16 19.1	1 16 8.0	1 15 57.0	1 15 46.0	1 15 34.9	+0.62	−1.10

AZIMUTH OF POLARIS AT ELONGATION, 1914.

Decl. t.	88° 50′ 40″	88° 50′ 50″	88° 51′ 0″	88° 51′ 10″	88° 51′ 20″	88° 51′ 30″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
25 0	1 16 30.1	1 16 19.1	1 16 8.0	1 15 57.0	1 15 46.0	1 15 34.9	+0.62	−1.10
25 20	1 16 42.7	1 16 31.6	1 16 20.5	1 16 9.5	1 15 58.4	1 15 47.4	0.63	1.11
25 40	1 16 55.5	1 16 44.4	1 16 33.3	1 16 22.2	1 16 11.1	1 16 0.0	0.64	1.11
26 0	1 17 8.5	1 16 57.4	1 16 46.2	1 16 35.1	1 16 24.0	1 16 12.9	0.65	1.11
26 20	1 17 21.7	1 17 10.6	1 16 59.4	1 16 48.3	1 16 37.1	1 16 26.0	0.66	1.11
26 40	1 17 35.2	1 17 24.0	1 17 12.8	1 17 1.7	1 16 50.5	1 16 39.3	+0.68	−1.12
27 0	1 17 48.9	1 17 37.7	1 17 26.5	1 17 15.3	1 17 4.1	1 16 52.8	0.69	1.12
27 20	1 18 2.9	1 17 51.6	1 17 40.4	1 17 29.2	1 17 17.9	1 17 6.6	0.70	1.13
27 40	1 18 17.1	1 18 5.8	1 17 54.5	1 17 43.3	1 17 32.0	1 17 20.7	0.71	1.13
28 0	1 18 31.6	1 18 20.2	1 18 8.9	1 17 57.6	1 17 46.3	1 17 34.9	0.72	1.13
28 20	1 18 46.3	1 18 34.9	1 18 23.5	1 18 12.2	1 18 0.8	1 17 49.5	+0.74	−1.14
28 40	1 19 1.2	1 18 49.8	1 18 38.4	1 18 27.0	1 18 15.6	1 18 4.3	0.75	1.14
29 0	1 19 16.4	1 19 5.0	1 18 53.6	1 18 42.2	1 18 30.7	1 18 19.3	0.76	1.14
29 20	1 19 31.9	1 19 20.4	1 19 8.9	1 18 57.5	1 18 46.0	1 18 34.6	0.77	1.15
29 40	1 19 47.6	1 19 36.1	1 19 24.6	1 19 13.1	1 19 1.6	1 18 50.1	0.79	1.15
30 0	1 20 3.6	1 19 52.1	1 19 40.5	1 19 29.0	1 19 17.5	1 19 5.9	+0.80	−1.15
30 10	1 20 11.7	1 20 0.1	1 19 48.6	1 19 37.1	1 19 25.5	1 19 13.9	0.81	1.16
30 20	1 20 19.9	1 20 8.3	1 19 56.7	1 19 45.2	1 19 33.6	1 19 22.0	0.81	1.16
30 30	1 20 28.1	1 20 16.5	1 20 4.9	1 19 53.4	1 19 41.8	1 19 30.1	0.82	1.16
30 40	1 20 36.4	1 20 24.8	1 20 13.2	1 20 1.6	1 19 50.0	1 19 38.4	0.83	1.16
30 50	1 20 44.8	1 20 33.1	1 20 21.5	1 20 9.9	1 19 58.3	1 19 46.6	+0.84	−1.16
31 0	1 20 53.3	1 20 41.6	1 20 30.0	1 20 18.3	1 20 6.6	1 19 55.0	0.84	1.17
31 10	1 21 1.8	1 20 50.1	1 20 38.4	1 20 26.8	1 20 15.1	1 20 3.4	0.85	1.17
31 20	1 21 10.4	1 20 58.7	1 20 47.0	1 20 35.3	1 20 23.6	1 20 11.9	0.86	1.17
31 30	1 21 19.1	1 21 7.4	1 20 55.6	1 20 43.9	1 20 32.2	1 20 20.4	0.86	1.17
31 40	1 21 27.8	1 21 16.1	1 21 4.3	1 20 52.6	1 20 40.8	1 20 29.1	+0.87	−1.17
31 50	1 21 36.6	1 21 24.8	1 21 13.0	1 21 1.3	1 20 49.5	1 20 37.8	0.88	1.18
32 0	1 21 45.5	1 21 33.7	1 21 21.9	1 21 10.1	1 20 58.3	1 20 46.5	0.89	1.18
32 10	1 21 54.5	1 21 42.7	1 21 30.8	1 21 19.0	1 21 7.2	1 20 55.4	0.89	1.18
32 20	1 22 3.5	1 21 51.7	1 21 39.8	1 21 28.0	1 21 16.2	1 21 4.3	0.90	1.18
32 30	1 22 12.6	1 22 0.8	1 21 48.9	1 21 37.0	1 21 25.2	1 21 13.3	+0.91	−1.19
32 40	1 22 21.8	1 22 9.9	1 21 58.0	1 21 46.1	1 21 34.3	1 21 22.4	0.91	1.19
32 50	1 22 31.1	1 22 19.2	1 22 7.2	1 21 55.3	1 21 43.4	1 21 31.5	0.92	1.19
33 0	1 22 40.4	1 22 28.5	1 22 16.5	1 22 4.6	1 21 52.7	1 21 40.7	0.93	1.19
33 10	1 22 49.8	1 22 37.9	1 22 25.9	1 22 13.9	1 22 2.0	1 21 50.0	0.94	1.20
33 20	1 22 59.3	1 22 47.3	1 22 35.3	1 22 23.4	1 22 11.4	1 21 59.4	+0.95	−1.20
33 30	1 23 8.9	1 22 56.9	1 22 44.9	1 22 32.9	1 22 20.9	1 22 8.9	0.95	1.20
33 40	1 23 18.5	1 23 6.5	1 22 54.4	1 22 42.4	1 22 30.4	1 22 18.4	0.96	1.20
33 50	1 23 28.2	1 23 16.2	1 23 4.2	1 22 52.1	1 22 40.1	1 22 28.0	0.97	1.20
34 0	1 23 38.0	1 23 26.0	1 23 13.9	1 23 1.8	1 22 49.8	1 22 37.7	0.98	1.21
34 10	1 23 47.9	1 23 35.8	1 23 23.7	1 23 11.7	1 22 59.6	1 22 47.5	+0.99	−1.21
34 20	1 23 57.9	1 23 45.8	1 23 33.7	1 23 21.6	1 23 9.4	1 22 57.3	0.99	1.21
34 30	1 24 8.0	1 23 55.9	1 23 43.7	1 23 31.5	1 23 19.4	1 23 7.3	1.00	1.21
34 40	1 24 18.1	1 24 6.0	1 23 53.8	1 23 41.6	1 23 29.4	1 23 17.3	1.01	1.22
34 50	1 24 28.3	1 24 16.1	1 24 3.9	1 23 51.7	1 23 39.6	1 23 27.4	1.02	1.22
35 0	1 24 38.6	1 24 26.4	1 24 14.2	1 24 2.0	1 23 49.8	1 23 37.5	+1.03	−1.22
35 10	1 24 49.0	1 24 36.8	1 24 24.5	1 24 12.3	1 24 0.0	1 23 47.8	1.04	1.22
35 20	1 24 59.5	1 24 47.3	1 24 35.0	1 24 22.7	1 24 10.4	1 23 58.2	1.05	1.23
35 30	1 25 10.1	1 24 57.8	1 24 45.5	1 24 33.2	1 24 20.9	1 24 8.6	1.05	1.23
35 40	1 25 20.7	1 25 8.4	1 24 56.0	1 24 43.7	1 24 31.4	1 24 19.1	1.06	1.23
35 50	1 25 31.4	1 25 19.1	1 25 6.7	1 24 54.4	1 24 42.1	1 24 29.7	+1.07	−1.23
36 0	1 25 42.2	1 25 29.9	1 25 17.5	1 25 5.1	1 24 52.8	1 24 40.4	1.08	1.24
36 10	1 25 53.1	1 25 40.7	1 25 28.3	1 25 16.0	1 25 3.6	1 24 51.2	1.09	1.24
36 20	1 26 4.1	1 25 51.7	1 25 39.3	1 25 26.9	1 25 14.5	1 25 2.1	1.10	1.24
36 30	1 26 15.2	1 26 2.8	1 25 50.3	1 25 37.9	1 25 25.5	1 25 13.0	1.11	1.24
36 40	1 26 26.4	1 26 14.0	1 26 1.5	1 25 49.0	1 25 36.6	1 25 24.1	+1.12	−1.25
36 50	1 26 37.7	1 26 25.2	1 26 12.7	1 26 0.2	1 25 47.7	1 25 35.2	1.13	1.25
37 0	1 26 49.1	1 26 36.6	1 26 24.0	1 26 11.5	1 25 59.0	1 25 46.5	1.14	1.25
37 10	1 27 0.6	1 26 48.1	1 26 35.5	1 26 22.9	1 26 10.3	1 25 57.8	1.15	1.26
37 20	1 27 12.1	1 26 59.6	1 26 47.0	1 26 34.4	1 26 21.8	1 26 9.2	1.15	1.26
37 30	1 27 23.7	1 27 11.1	1 26 58.5	1 26 46.0	1 26 33.3	1 26 20.7	+1.16	−1.26

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1914.

Decl. / Lat.	88° 50′ 40″	88° 50′ 50″	88° 51′ 0″	88° 51′ 10″	88° 51′ 20″	88° 51′ 30″	Variation for— 1′ of Lat.	1″ of
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
37 30	1 27 23.7	1 27 11.1	1 26 58.5	1 26 46.0	1 26 33.3	1 26 20.7	+1.16	−1.2
37 40	1 27 35.5	1 27 22.9	1 27 10.2	1 26 57.6	1 26 45.0	1 26 32.4	1.17	1.2
37 50	1 27 47.4	1 27 34.7	1 27 22.0	1 27 9.4	1 26 56.7	1 26 44.1	1.18	1.2
38 0	1 27 59.3	1 27 46.6	1 27 33.9	1 27 21.3	1 27 8.6	1 26 55.9	1.19	1.2
38 10	1 28 11.3	1 27 58.6	1 27 45.9	1 27 33.2	1 27 20.5	1 27 7.8	1.20	1.2
38 20	1 28 23.5	1 28 10.8	1 27 58.0	1 27 45.3	1 27 32.5	1 27 19.8	+1.21	−1.2
38 30	1 28 35.8	1 28 23.0	1 28 10.2	1 27 57.5	1 27 44.7	1 27 31.9	1.22	1.2
38 40	1 28 48.1	1 28 35.3	1 28 22.5	1 28 9.7	1 27 56.9	1 27 44.1	1.23	1.2
38 50	1 29 0.5	1 28 47.7	1 28 34.9	1 28 22.1	1 28 9.2	1 27 56.4	1.24	1.2
39 0	1 29 13.1	1 29 0.3	1 28 47.4	1 28 34.5	1 28 21.7	1 28 8.8	1.25	1.2
39 10	1 29 25.8	1 29 12.9	1 29 0.0	1 28 47.1	1 28 34.2	1 28 21.3	+1.26	−1.2
39 20	1 29 38.6	1 29 25.6	1 29 12.7	1 28 59.8	1 28 46.9	1 28 33.9	1.27	1.2
39 30	1 29 51.4	1 29 38.4	1 29 25.5	1 29 12.6	1 28 59.6	1 28 46.7	1.28	1.2
39 40	1 30 4.3	1 29 51.3	1 29 38.4	1 29 25.5	1 29 12.5	1 28 59.5	1.30	1.3
39 50	1 30 17.4	1 30 4.4	1 29 51.5	1 29 38.5	1 29 25.4	1 29 12.4	1.31	1.3
40 0	1 30 30.6	1 30 17.5	1 30 4.5	1 29 51.6	1 29 38.5	1 29 25.5	+1.32	−1.3
40 10	1 30 43.9	1 30 30.8	1 30 17.8	1 30 4.8	1 29 51.7	1 29 38.6	1.33	1.3
40 20	1 30 57.4	1 30 44.3	1 30 31.2	1 30 18.1	1 30 5.0	1 29 51.9	1.34	1.3
40 30	1 31 11.0	1 30 57.8	1 30 44.7	1 30 31.6	1 30 18.4	1 30 5.3	1.35	1.3
40 40	1 31 24.7	1 31 11.5	1 30 58.3	1 30 45.1	1 30 31.9	1 30 18.8	1.36	1.3
40 50	1 31 38.4	1 31 25.2	1 31 12.0	1 30 58.8	1 30 45.6	1 30 32.4	+1.37	−1.3
41 0	1 31 52.3	1 31 39.1	1 31 25.8	1 31 12.6	1 30 59.3	1 30 46.1	1.38	1.3
41 10	1 32 6.3	1 31 53.0	1 31 39.7	1 31 26.5	1 31 13.2	1 30 59.9	1.40	1.33
41 20	1 32 20.4	1 32 7.1	1 31 53.8	1 31 40.5	1 31 27.2	1 31 13.9	1.41	1.33
41 30	1 32 34.6	1 32 21.3	1 32 8.0	1 31 54.7	1 31 41.3	1 31 27.9	1.42	1.33
41 40	1 32 49.0	1 32 35.6	1 32 22.2	1 32 8.9	1 31 55.5	1 31 42.1	+1.43	−1.34
41 50	1 33 3.5	1 32 50.0	1 32 36.6	1 32 23.3	1 32 9.8	1 31 56.4	1.45	1.34
42 0	1 33 18.1	1 33 4.6	1 32 51.2	1 32 37.8	1 32 24.3	1 32 10.8	1.46	1.35
42 10	1 33 32.8	1 33 19.3	1 33 5.8	1 32 52.4	1 32 38.9	1 32 25.4	1.47	1.35
42 20	1 33 47.7	1 33 34.2	1 33 20.6	1 33 7.1	1 32 53.6	1 32 40.1	1.48	1.35
42 30	1 34 2.7	1 33 49.1	1 33 35.5	1 33 22.0	1 33 8.4	1 32 54.9	+1.50	−1.36
42 40	1 34 17.8	1 34 4.2	1 33 50.6	1 33 37.0	1 33 23.4	1 33 9.8	1.51	1.36
42 50	1 34 33.0	1 34 19.4	1 34 5.7	1 33 52.1	1 33 38.5	1 33 24.9	1.52	1.36
43 0	1 34 48.4	1 34 34.7	1 34 21.0	1 34 7.4	1 33 53.7	1 33 40.0	1.54	1.37
43 10	1 35 3.9	1 34 50.1	1 34 36.4	1 34 22.8	1 34 9.1	1 33 55.4	1.55	1.37
43 20	1 35 19.5	1 35 5.7	1 34 52.0	1 34 38.3	1 34 24.6	1 34 10.8	+1.56	−1.37
43 30	1 35 35.3	1 35 21.5	1 35 7.7	1 34 54.0	1 34 40.2	1 34 26.4	1.57	1.38
43 40	1 35 51.2	1 35 37.4	1 35 23.5	1 35 9.7	1 34 55.9	1 34 42.1	1.59	1.38
43 50	1 36 7.2	1 35 53.3	1 35 39.5	1 35 25.7	1 35 11.8	1 34 57.9	1.60	1.39
44 0	1 36 23.4	1 36 9.4	1 35 55.5	1 35 41.7	1 35 27.8	1 35 13.9	1.61	1.39
44 10	1 36 39.7	1 36 25.7	1 36 11.8	1 35 57.9	1 35 44.0	1 35 30.0	+1.63	−1.39
44 20	1 36 56.2	1 36 42.2	1 36 28.2	1 36 14.3	1 36 0.3	1 35 46.3	1.65	1.40
44 30	1 37 12.8	1 36 58.8	1 36 44.8	1 36 30.8	1 36 16.7	1 36 2.7	1.66	1.40
44 40	1 37 29.6	1 37 15.5	1 37 1.5	1 36 47.4	1 36 33.3	1 36 19.3	1.67	1.41
44 50	1 37 46.5	1 37 32.4	1 37 18.3	1 37 4.2	1 36 50.1	1 36 36.0	1.69	1.41
45 0	1 38 3.6	1 37 49.5	1 37 35.3	1 37 21.1	1 37 6.9	1 36 52.8	+1.70	−1.42
45 10	1 38 20.8	1 38 6.7	1 37 52.4	1 37 38.2	1 37 24.0	1 37 9.8	1.72	1.42
45 20	1 38 38.1	1 38 23.9	1 38 9.6	1 37 55.4	1 37 41.2	1 37 26.9	1.73	1.42
45 30	1 38 55.6	1 38 41.3	1 38 27.0	1 38 12.8	1 37 58.5	1 37 44.2	1.75	1.43
45 40	1 39 13.2	1 38 58.9	1 38 44.6	1 38 30.3	1 38 16.0	1 38 1.7	1.76	1.43
45 50	1 39 31.0	1 39 16.7	1 39 2.3	1 38 48.0	1 38 33.6	1 38 19.3	+1.78	−1.43
46 0	1 39 49.0	1 39 34.6	1 39 20.2	1 39 5.8	1 38 51.4	1 38 37.0	1.79	1.44
46 10	1 40 7.1	1 39 52.7	1 39 38.2	1 39 23.8	1 39 9.3	1 38 54.9	1.81	1.44
46 20	1 40 25.4	1 40 10.9	1 39 56.4	1 39 41.9	1 39 27.5	1 39 13.0	1.83	1.45
46 30	1 40 43.9	1 40 29.3	1 40 14.8	1 40 0.3	1 39 45.7	1 39 31.2	1.84	1.45
46 40	1 41 2.5	1 40 47.9	1 40 33.3	1 40 18.7	1 40 4.2	1 39 49.6	+1.86	−1.46
46 50	1 41 21.3	1 41 6.7	1 40 52.0	1 40 37.4	1 40 22.8	1 40 8.1	1.88	1.46
47 0	1 41 40.2	1 41 25.6	1 41 10.9	1 40 56.2	1 40 41.5	1 40 26.9	1.89	1.47
47 10	1 41 59.3	1 41 44.6	1 41 29.9	1 41 15.2	1 41 0.5	1 40 45.8	1.91	1.47
47 20	1 42 18.6	1 42 3.9	1 41 49.1	1 41 34.3	1 41 19.6	1 41 4.8	1.93	1.48
47 30	1 42 38.1	1 42 23.3	1 42 8.5	1 41 53.7	1 41 38.8	1 41 24.0	+1.94	−1.48

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1914.

Decl. / Lat.	88° 50′ 40″	88° 50′ 50″	88° 51′ 0″	88° 51′ 10″	88° 51′ 20″	88° 51′ 30″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
47 30	1 42 38.1	1 42 23.3	1 42 8.5	1 41 53.7	1 41 38.8	1 41 24.0	+1.94	−1.48
47 40	1 42 57.7	1 42 42.9	1 42 28.0	1 42 13.2	1 41 58.3	1 41 43.5	1.96	1.48
47 50	1 43 17.5	1 43 2.6	1 42 47.7	1 42 32.8	1 42 17.9	1 42 3.0	1.98	1.49
48 0	1 43 37.5	1 43 22.6	1 43 7.6	1 42 52.7	1 42 37.7	1 42 22.8	2.00	1.49
48 10	1 43 57.7	1 43 42.7	1 43 27.7	1 43 12.7	1 42 57.7	1 42 42.7	2.02	1.50
48 20	1 44 18.1	1 44 3.0	1 43 48.0	1 43 33.0	1 43 17.9	1 43 2.9	+2.04	−1.50
48 30	1 44 38.7	1 44 23.6	1 44 8.5	1 43 53.4	1 43 38.3	1 43 23.2	2.06	1.51
48 40	1 44 59.5	1 44 44.4	1 44 29.2	1 44 14.0	1 43 58.8	1 43 43.7	2.07	1.52
48 50	1 45 20.4	1 45 5.3	1 44 50.0	1 44 34.7	1 44 19.5	1 44 4.3	2.09	1.52
49 0	1 45 41.5	1 45 26.3	1 45 11.0	1 44 55.7	1 44 40.5	1 44 25.2	2.11	1.53
49 10	1 46 2.8	1 45 47.5	1 45 32.2	1 45 16.9	1 45 1.6	1 44 46.3	+2.13	−1.53
49 20	1 46 24.3	1 46 9.0	1 45 53.6	1 45 38.3	1 45 22.9	1 45 7.6	2.15	1.53
49 30	1 46 46.0	1 46 30.6	1 46 15.2	1 45 59.8	1 45 44.4	1 45 29.0	2.17	1.54
49 40	1 47 7.9	1 46 52.4	1 46 37.0	1 46 21.6	1 46 6.1	1 45 50.7	2.19	1.54
49 50	1 47 30.0	1 47 14.5	1 46 59.0	1 46 43.6	1 46 28.1	1 46 12.6	2.21	1.55
50 0	1 47 52.4	1 47 36.8	1 47 21.3	1 47 5.8	1 46 50.2	1 46 34.6	+2.23	−1.56
50 10	1 48 14.9	1 47 59.3	1 47 43.7	1 47 28.1	1 47 12.5	1 46 56.9	2.25	1.56
50 20	1 48 37.7	1 48 22.0	1 48 6.3	1 47 50.7	1 47 35.1	1 47 19.4	2.27	1.57
50 30	1 49 0.7	1 48 45.0	1 48 29.2	1 48 13.5	1 47 57.8	1 47 42.1	2.30	1.57
50 40	1 49 23.9	1 49 8.1	1 48 52.3	1 48 36.6	1 48 20.8	1 48 5.0	2.32	1.58
50 50	1 49 47.3	1 49 31.5	1 49 15.6	1 48 59.8	1 48 44.0	1 48 28.2	+2.34	−1.58
51 0	1 50 10.9	1 49 55.0	1 49 39.1	1 49 23.3	1 49 7.4	1 48 51.5	2.36	1.59
51 10	1 50 34.8	1 50 18.8	1 50 2.9	1 49 47.0	1 49 31.1	1 49 15.1	2.38	1.59
51 20	1 50 58.9	1 50 42.9	1 50 26.9	1 50 10.9	1 49 54.9	1 49 38.9	2.41	1.60
51 30	1 51 23.2	1 51 7.2	1 50 51.1	1 50 35.1	1 50 19.0	1 50 2.9	2.43	1.61
51 40	1 51 47.8	1 51 31.7	1 51 15.6	1 50 59.5	1 50 43.4	1 50 27.2	+2.46	−1.61
51 50	1 52 12.6	1 51 56.5	1 51 40.3	1 51 24.1	1 51 7.9	1 50 51.7	2.48	1.62
52 0	1 52 37.7	1 52 21.5	1 52 5.2	1 51 49.0	1 51 32.7	1 51 16.5	2.50	1.62
52 10	1 53 3.0	1 52 46.7	1 52 30.4	1 52 14.1	1 51 57.8	1 51 41.5	2.52	1.63
52 20	1 53 28.5	1 53 12.1	1 52 55.7	1 52 39.4	1 52 23.1	1 52 6.7	2.55	1.64
52 30	1 53 54.3	1 53 37.9	1 53 21.5	1 53 5.0	1 52 48.6	1 52 32.2	+2.58	−1.64
52 40	1 54 20.4	1 54 3.9	1 53 47.4	1 53 30.9	1 53 14.4	1 52 57.9	2.60	1.65
52 50	1 54 46.7	1 54 30.1	1 54 13.5	1 53 57.0	1 53 40.4	1 53 23.9	2.63	1.66
53 0	1 55 13.3	1 54 56.6	1 54 40.0	1 54 23.4	1 54 6.8	1 53 50.1	2.65	1.66
53 10	1 55 40.1	1 55 23.4	1 55 6.7	1 54 50.0	1 54 33.3	1 54 16.6	2.68	1.67
53 20	1 56 7.2	1 55 50.4	1 55 33.6	1 55 16.9	1 55 0.2	1 54 43.4	+2.71	−1.68
53 30	1 56 34.6	1 56 17.7	1 56 0.9	1 55 44.1	1 55 27.3	1 55 10.5	2.74	1.68
53 40	1 57 2.2	1 56 45.3	1 56 28.4	1 56 11.5	1 55 54.7	1 55 37.8	2.76	1.69
53 50	1 57 30.1	1 57 13.1	1 56 56.2	1 56 39.3	1 56 22.3	1 56 5.4	2.79	1.69
54 0	1 57 58.3	1 57 41.3	1 57 24.3	1 57 7.3	1 56 50.2	1 56 33.2	2.81	1.70
54 10	1 58 26.8	1 58 9.7	1 57 52.6	1 57 35.5	1 57 18.5	1 57 1.4	+2.84	−1.71
54 20	1 58 55.6	1 58 38.4	1 58 21.2	1 58 4.1	1 57 47.0	1 57 29.8	2.88	1.72
54 30	1 59 24.7	1 59 7.5	1 58 50.2	1 58 33.0	1 58 15.8	1 57 58.6	2.91	1.72
54 40	1 59 54.1	1 59 36.8	1 59 19.5	1 59 2.2	1 58 44.9	1 58 27.6	2.94	1.73
54 50	2 0 23.8	2 0 6.4	1 59 49.0	1 59 31.6	1 59 14.3	1 58 56.9	2.97	1.74
55 0	2 0 53.8	2 0 36.4	2 0 18.9	2 0 1.4	1 59 44.0	1 59 26.5	+3.00	−1.75
55 10	2 1 24.1	2 1 6.6	2 0 49.0	2 0 31.5	2 0 14.0	1 59 56.5	3.03	1.75
55 20	2 1 54.7	2 1 37.1	2 1 19.5	2 1 1.9	2 0 44.3	2 0 26.7	3.06	1.76
55 30	2 2 25.6	2 2 8.0	2 1 50.3	2 1 32.6	2 1 15.0	2 0 57.3	3.09	1.77
55 40	2 2 56.9	2 2 39.2	2 2 21.5	2 2 3.7	2 1 45.9	2 1 28.2	3.12	1.77
55 50	2 3 28.5	2 3 10.7	2 2 52.8	2 2 35.0	2 2 17.2	2 1 59.4	+3.15	−1.78
56 0	2 4 0.4	2 3 42.5	2 3 24.6	2 3 6.7	2 2 48.8	2 2 30.9	3.19	1.79
56 10	2 4 32.7	2 4 14.7	2 3 56.7	2 3 38.8	2 3 20.8	2 3 2.8	3.23	1.80
56 20	2 5 5.3	2 4 47.3	2 4 29.2	2 4 11.2	2 3 53.1	2 3 35.1	3.26	1.80
56 30	2 5 38.3	2 5 20.2	2 5 2.0	2 4 43.9	2 4 25.8	2 4 7.6	3.30	1.81
56 40	2 6 11.6	2 5 53.4	2 5 35.2	2 5 17.0	2 4 58.8	2 4 40.6	+3.33	−1.82
56 50	2 6 45.3	2 6 27.0	2 6 8.7	2 5 50.4	2 5 32.1	2 5 13.8	3.36	1.83
57 0	2 7 19.3	2 7 1.0	2 6 42.6	2 6 24.2	2 6 5.8	2 5 47.5	3.40	1.84
57 10	2 7 53.7	2 7 35.3	2 7 16.8	2 6 58.4	2 6 39.9	2 6 21.5	3.44	1.84
57 20	2 8 28.5	2 8 10.0	2 7 51.5	2 7 32.9	2 7 14.4	2 6 55.9	3.48	1.85
57 30	2 9 3.7	2 8 45.1	2 8 26.4	2 8 7.8	2 7 49.2	2 7 30.6	+3.52	−1.86

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1914.

Decl. / Lat.	88° 50′ 40″	88° 50′ 50″	88° 51′ 0′	88° 51′ 10″	88° 51′ 20″	88° 51′ 30″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
57 30	2 9 3.7	2 8 45.1	2 8 26.4	2 8 7.8	2 7 49.2	2 7 30.6	+3.52	−1.86
57 40	2 9 39.3	2 9 20.6	2 9 1.9	2 8 43.2	2 8 24.5	2 8 5.8	3.56	1.87
57 50	2 10 15.3	2 9 56.5	2 9 37.7	2 9 18.9	2 9 0.1	2 8 41.3	3.59	1.88
58 0	2 10 51.6	2 10 32.7	2 10 13.8	2 9 55.0	2 9 36.1	2 9 17.2	3.63	1.89
58 10	2 11 28.4	2 11 9.4	2 10 50.4	2 10 31.5	2 10 12.5	2 9 53.5	3.68	1.90
58 20	2 12 5.6	2 11 46.5	2 11 27.4	2 11 8.4	2 10 49.3	2 10 30.3	+3.72	−1.91
58 30	2 12 43.2	2 12 24.0	2 12 4.8	2 11 45.7	2 11 26.6	2 11 7.4	3.76	1.92
58 40	2 13 21.2	2 13 2.0	2 12 42.7	2 12 23.5	2 12 4.3	2 11 45.0	3.80	1.92
58 50	2 13 59.7	2 13 40.4	2 13 21.0	2 13 1.7	2 12 42.3	2 12 23.0	3.84	1.93
59 0	2 14 38.6	2 14 19.2	2 13 59.7	2 13 40.3	2 13 20.9	2 13 1.5	3.89	1.94
59 10	2 15 17.9	2 14 58.4	2 14 38.9	2 14 19.4	2 13 59.9	2 13 40.3	+3.94	−1.95
59 20	2 15 57.7	2 15 38.1	2 15 18.5	2 14 58.9	2 14 39.3	2 14 19.7	3.98	1.96
59 30	2 16 38.0	2 16 18.3	2 15 58.6	2 15 38.9	2 15 19.2	2 14 59.5	4.02	1.97
59 40	2 17 18.7	2 16 58.9	2 16 39.1	2 16 19.3	2 15 59.5	2 15 39.7	4.07	1.98
59 50	2 18 0.0	2 17 40.1	2 17 20.2	2 17 0.2	2 16 40.3	2 16 20.4	4.12	1.99
60 0	2 18 41.7	2 18 21.7	2 18 1.7	2 17 41.7	2 17 21.6	2 17 1.6	+4.17	−2.00

TABLE Va.

FOR REDUCING TO ELONGATION, OBSERVATIONS MADE NEAR ELONGATION.

Azimuth at Elong. / *Time.	1° 10′	1° 20′	1° 30′	1° 40′	1° 50′	2° 0′	2° 10′	2° 20′	Azimuth at Elong. / Time.*
m	″	″	″	″	″	″	″	″	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.2	1
2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	2
3	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7	3
4	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	4
5	+ 1.0	+ 1.1	+ 1.3	+ 1.4	+ 1.6	+ 1.7	+ 1.9	+ 2.0	5
6	1.4	1.6	1.8	2.1	2.3	2.5	2.7	2.9	6
7	2.0	2.2	2.5	2.8	3.1	3.4	3.7	3.9	7
8	2.6	2.9	3.3	3.7	4.0	4.4	4.8	5.1	8
9	3.3	3.7	4.2	4.7	5.1	5.5	6.0	6.5	9
10	+ 4.0	+ 4.6	+ 5.1	+ 5.7	+ 6.3	+ 6.8	+ 7.4	+ 8.0	10
11	4.9	5.6	6.2	6.9	7.6	8.3	9.0	9.7	11
12	5.8	6.6	7.4	8.2	9.0	9.9	10.7	11.5	12
13	6.8	7.8	8.7	9.7	10.6	11.6	12.5	13.5	13
14	7.8	9.0	10.1	11.2	12.3	13.4	14.5	15.7	14
15	+ 9.0	+10.3	+11.6	+12.9	+14.1	+15.4	+16.7	+18.0	15
16	10.2	11.7	13.2	14.6	16.1	17.5	19.0	20.4	16
17	11.5	13.2	14.9	16.4	18.2	19.8	21.4	23.0	17
18	12.9	14.8	16.7	18.5	20.4	22.2	24.0	25.9	18
19	14.4	16.5	18.6	20.7	22.7	24.7	26.8	28.9	19
20	+16.0	+18.3	+20.6	+22.9	+25.1	+27.4	+29.7	+32.0	20
21	17.7	20.2	22.7	25.2	27.7	30.2	32.7	35.3	21
22	19.4	22.1	24.9	27.6	30.4	33.2	35.9	38.7	22
23	21.2	24.2	27.2	30.2	33.2	36.3	39.2	42.3	23
24	23.0	26.3	29.6	32.9	36.2	39.4	42.7	46.0	24
25	+25.0	+28.6	+32.1	+35.7	+39.3	+42.7	+46.3	+49.9	25
26	27.0	30.9	34.7	38.6	42.4	46.3	50.1	54.0	26
27	29.1	33.3	37.5	41.6	45.7	50.0	54.0	58.2	27
28	31.3	35.8	40.3	44.7	49.2	53.7	58.1	62.6	28
29	33.6	38.4	43.2	48.0	52.8	57.6	62.3	67.1	29
30	+35.9	+41.1	+46.2	+51.4	+56.5	+61.6	+66.7	+71.8	30

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*Sidereal time from elongation.

FOR FINDING THE TIMES OF UPPER AND LOWER CULMINATION OF POLARIS FROM THE OBSERVED TIMES WHEN THE STAR IS ON THE SAME VERTICAL CIRCLE WITH THE STARS ζ URSÆ MAJORIS (MIZAR) *SUB POLO* AND δ CASSIOPEIÆ *SUB POLO*, RESPECTIVELY.

Except at high latitudes, the pole star at either upper or lower culmination furnishes a simple and convenient method for laying down a meridian line on the earth's surface at points in the northern hemisphere. When the local time is unknown and accurate astronomical instruments are not available, the time of culmination of Polaris may be found by observing the instant when Polaris is vertically above (has the same azimuth as) ζ Ursæ Majoris (Mizar) below the pole, or δ Cassiopeiæ below the pole. In the former case, for the year 1914, Polaris is approaching upper culmination and in the latter case it is approaching lower culmination. The mean time interval which elapses between the observed times above mentioned and upper or lower culmination, as the case may be, are given for ζ Ursæ Majoris and δ Cassiopeiæ for ten-day intervals in the following table. This method can not be used at places south of 30° north latitude.

TABLE VI.

MEAN TIME INTERVAL.

ζ URSÆ MAJORIS (MIZAR).
(Upper culmination of Polaris.)

1914 \ Lat.		40°	45°	50°	55°	60°
		m s	m s	m s	m s	m s
Jan.	1	7 46	7 45	7 43	7 41	7 38
	11	7 36	7 35	7 33	7 31	7 28
	21	7 26	7 24	7 22	7 20	7 18
July	10	7 41	7 40	7 38	7 36	7 33
	20	7 53	7 51	7 49	7 47	7 44
	30	8 3	8 1	7 59	7 57	7 54
Aug.	9	8 13	8 11	8 9	8 7	8 4
	19	8 23	8 21	8 19	8 17	8 14
	29	8 32	8 30	8 28	8 25	8 22
Sept.	8	8 39	8 37	8 35	8 32	8 29
	18	8 45	8 43	8 41	8 39	8 35
	28	8 50	8 49	8 47	8 44	8 41
Oct.	8	8 54	8 52	8 50	8 47	8 44
	18	8 55	8 53	8 51	8 49	8 45
	28	8 55	8 54	8 52	8 49	8 46
Nov.	7	8 54	8 53	8 51	8 48	8 45
	17	8 51	8 49	8 47	8 45	8 41
	27	8 46	8 44	8 42	8 39	8 36
Dec.	7	8 40	8 38	8 36	8 33	8 30
	17	8 32	8 30	8 28	8 26	8 23
	27	8 22	8 21	8 19	8 16	8 13
	37	8 12	8 10	8 9	8 6	8 3

δ CASSIOPEIÆ.
(Lower culmination of Polaris.)

1914 \ Lat.		35°	40°	45°	50°	55°
		m s	m s	m s	m s	m s
Jan.	1	8 51	8 53	8 54	8 56	8 59
	11	8 41	8 43	8 44	8 46	8 49
	21	8 30	8 32	8 33	8 35	8 37
	31	8 19	8 20	8 22	8 24	8 26
Feb.	10	8 9	8 10	8 12	8 14	8 16
	20	8 0	8 2	8 3	8 5	8 7
Mar.	2	7 52	7 53	7 55	7 56	7 59
	12	7 45	7 47	7 48	7 50	7 52
	22	7 41	7 43	7 44	7 46	7 48
Apr.	1	7 39	7 40	7 42	7 43	7 46
	11	7 38	7 39	7 41	7 43	7 45
	21	7 40	7 41	7 43	7 45	7 47
May	1	7 44	7 45	7 47	7 49	7 51
	11	7 50	7 51	7 53	7 54	7 56
	21	7 56	7 57	7 59	8 1	8 3
	31	8 5	8 6	8 7	8 9	8 12
June	10	8 15	8 16	8 18	8 20	8 22
	20	8 25	8 26	8 28	8 30	8 32
	30	8 35	8 37	8 38	8 40	8 43
July	10	8 46	8 48	8 50	8 52	8 54
	20	8 58	9 0	9 1	9 3	9 6
	30	9 9	9 10	9 12	9 14	9 17

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

The matter contained in the first 175 pages of this volume is intended primarily for the use of navigators, and consists of ephemerides of the Sun and Moon and of the planets Mercury, Venus, Mars, Jupiter, and Saturn. The remainder of the book contains ephemerides of all the planets, of their satellites, of 825 fixed stars, elements for the computation of predictions of eclipses of the Sun and Moon and of occultations of stars, tables of the pole star, Polaris, and in addition miscellaneous data for the convenience and use of astronomers, surveyors, and the general public.

TIME.

There are in general use three different kinds of time, True Solar Time—also called Apparent Solar Time—Mean Solar Time, and Sidereal Time.

True or Apparent Solar Time is measured by the diurnal motion of the Sun, the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being the hour-angle of the Sun westward from the meridian. Owing to the obliquity of the ecliptic and to the lack of uniformity of the motion of the Earth in its orbit, the rate of motion of the Sun in hour-angle and the length of the apparent solar day are not constant. Therefore clocks and chronometers can not be regulated to apparent solar time, which may, however, be determined by observations of the Sun when visible.

Mean Solar Time is measured by the motion of a fictitious body called the mean Sun which is supposed to move uniformly in the celestial equator, completing the circuit in one tropical year. Since mean solar time is uniform and regular in its passage, clocks and watches may be regulated to it, and those in ordinary use are usually so regulated.

Mean solar time can not, of course, be determined by direct observation, but may be determined indirectly by correcting observations of the Sun for the equation of time (page 702), or by converting to mean time sidereal time determined by observations of fixed stars (page 701).

The Mean Solar Day is the unit of mean solar time, and is equal in length to the mean or average of all the true or apparent solar days of the year. It may be otherwise defined as the interval of time elapsing between two successive transits of the mean Sun across the meridian of any place.

Sidereal Time or star time, in general terms, is measured by the diurnal motion of the fixed stars, or, speaking more precisely, by the diurnal motion of that point on the celestial equator called the vernal equinox, from which the right ascensions of the heavenly bodies are measured. Astronomical clocks regulated to sidereal time are called sidereal clocks. Sidereal time may be determined from observations of stars whose right ascensions are known.

A Sidereal Day is very nearly the length of time in which the Earth rotates on its axis and is accurately defined as the time interval between two successive transits of the vernal equinox over the same meridian. The sidereal day is shorter than the mean solar day by $3^m\ 56^s.555$ sidereal time or $3^m\ 55^s.909$ mean solar time, the tropical year of 365.2422 mean solar days containing 366.2422 sidereal days. Sidereal time and the length of the sidereal day are subject to slight irregularities on account of small differences between the positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours. About March 23 (civil date) of each year, about two days after the vernal equinox, there is an instant when the face of a sidereal clock shows the same time as a mean time clock, and the former gains on the latter $3^m\ 56^s.555$ sidereal time per mean solar day, so that at the end of a year it will have gained one sidereal day and will again agree with the mean time clock.

The Equation of Time is the difference in hour-angle between the true Sun and the mean Sun. The true Sun is sometimes before and sometimes behind the mean Sun by an amount which varies from zero to about 16 minutes. The equation of time is given on pages I and II of each month of the Greenwich Ephemeris, and in the Solar Ephemeris for the Meridian of Washington, pages 518–525.

The Civil Day begins at midnight and comprises 24 hours, the hours being counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

The Astronomical Day begins at noon on the civil day of the same date, the 24 hours being counted from 0 to 24, running from noon of one day to noon of the next following day. Astronomical time as well as civil time may be either apparent or mean.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day corresponds to the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h, astronomical time; and January 9, 2 o'clock, P. M., civil time, is January 9, 2^h, astronomical time.

PRECEPTS FOR THE CONVERSION OF TIME.

To convert Sidereal Time at any place into Mean Solar Time, subtract the sidereal time of local mean noon for the beginning of the astronomical day, from the given sidereal time, and convert the interval of sidereal time thus found into mean time by means of Table II, page 686.

To convert Mean Solar Time at any place into Sidereal Time, convert the given interval of mean time (counted from mean noon) into sidereal time by means of Table III, page 689, and add the sidereal time of local mean noon for the beginning of the astronomical day.

Processes similar to the above may be employed, using the mean time of sidereal noon given on page III of the Greenwich Ephemeris instead of the sidereal time of mean noon.

To convert Apparent Solar Time into Mean Solar Time, add or subtract the equation of time as indicated on page I of the Greenwich Ephemeris, or add algebraically the equation of time taken from the Washington Solar Ephemeris, pages 518–525.

To convert Mean Solar Time into Apparent Solar Time, add or subtract the equation of time as indicated on page II of the Greenwich Ephemeris, or subtract algebraically the equation of time taken from the Washington Solar Ephemeris, pages 518–525.

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours; if the civil time is marked P. M., take away the designation P. M.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, write P. M. after it; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the days. For example, October 3, 23 hours, astronomical time, is October 4, 11 o'clock, A. M., civil time.

To convert Mean Solar or Sidereal Time of any meridian B to that of another meridian A, add the difference of longitude expressed in time when A is east of B, and subtract the difference of longitude when A is west of B.

PART I.—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–145 give data arranged under the heads of the several months, and are therefore designated as the Calendar. Each month covers 12 pages, numbered from I to XII, whose contents are as follows:

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying any one of these differences by the hours and parts of an hour from Greenwich apparent noon, and adding the product to, or subtracting it from, the corresponding quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity in question for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, but when great accuracy is required they should be interpolated for half the hours and parts of an hour of the Greenwich apparent time.

The *Equation of Time* given on page I is the mean time of apparent noon, or the hour-angle of the mean Sun at that instant. The heading of the column directs how the equation is to be applied to apparent time, or the time given by an observation of the Sun, in order to get mean time. When in the course of the month there is a change from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change occurs.

The Sun's Semidiameter and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The semidiameter is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object, to the distance from the center of the Sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the Sun's center over the wires of a transit instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

This page is chiefly used when the Sun is observed on the meridian, at which instant the local apparent time is $0^h\ 0^m\ 0^s$. The longitude from Greenwich expressed in time is then the corresponding Greenwich apparent time before or after noon according as the longitude is east or west. The longitude of any place is therefore the factor employed in reducing the quantities on this page to apparent noon at that place.

The right ascension of the Sun thus reduced is the sidereal time of local apparent noon, and the difference between that and the clock time of the meridian passage of the Sun is the error of the clock on sidereal time.

The declination of the Sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the Sun.

As an example of the use of page I:—

Let the Sun's declination be required at apparent noon, 1914, April 15, at a place whose longitude is 89° 40′, or $5^h\ 58^m\ 40^s$ west from Greenwich:—

		h	m	s
Local apparent time	April 15,	0	0	0
Longitude from Greenwich (additive)		5	58	40
Greenwich apparent time	April 15,	5	58	40

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $5^h.978$ after Greenwich apparent noon on April 15, or $18^h.022$ before Greenwich apparent noon on April 16.

On page 38 of the Ephemeris we find that the change of declination in one hour is:

	″
April 15, at Greenwich apparent noon	+53.81
April 16, at Greenwich apparent noon	+53.41
Difference for one day	− 0.40

If great exactness is desired, we find the amount of this hourly difference for the time which is halfway between Greenwich noon and the time of observation; that is, for 3 hours after Greenwich noon of the 15th, this being half of 6 hours. Three hours is 0.125 of a day; so the calculation is as follows:

	″
Difference for one hour, April 15	+53.81
Change for 0.125 of a day or $-0''.40\times0.125$ . . .	− 0.05
Difference at 3 hours after noon	+53.76

$$53''.76\times5.978=321''.4=5'\ 21''.4$$

		°	′	″
Declination at Greenwich noon, April 15 . .	N.	9	33	46.0
Change in 5.978 hours (additive)			5	21.4
Sun's declination at time of observation . .	N.	9	39	7.4

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given the time is $18^h.022$ before Greenwich noon of April 16; half this interval is about 0.375 of a day, and the hourly motion for the middle of the interval is 53″.56. Then, we find—

		°	′	″
Declination at Greenwich noon, April 16 . . .	N.	9	55	12.8
Product of $53''.56 \times 18.022 = 965''.3$ (subtractive) .			− 16	5.3
Sun's declination at time of observation . . .	N.	9	39	7.5

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly, the one derived from the nearest noon should be regarded as the more accurate. At sea, however, it is ordinarily sufficient to compute the declination to the nearest half minute, and the reduction may then be found by Table 12 of BOWDITCH'S *American Practical Navigator*.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given, and may be used in reducing them for the longitude, or to any Greenwich mean time. When great precision is required, these changes should be interpolated for half the Greenwich time, as described in explaining the calculation of the declination.

The *Equation of Time* given on page II is the apparent time of mean noon, and is equivalent to the hour-angle of the true Sun at the instant of mean noon. The heading of the column directs how the equation must be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^s.8565$; or by Table III, page 689 of this volume, for reducing intervals of mean solar to sidereal time; or by Table 9 of BOWDITCH'S *Navigator*.

The right ascensions and declinations on pages I and II are affected both by aberration and nutation, and therefore denote the *apparent* positions of the *true* Sun. Page I is used for observations which depend upon apparent time, as when the Sun is observed on the meridian; while page II is used when the times have been noted by a clock or chronometer regulated to mean time, as is the case in most observations of the Sun out of the meridian.

The Sun's declination is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth, and the equation of time is needed in finding the apparent time when determining the latitude from observations of the Sun out of the meridian.

The sidereal time of mean noon, or right ascension of the mean Sun, is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time, and this being added to the local astronomical mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time from noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II, page 686 of this volume, or from Table 8 of BOWDITCH'S *Navigator*. Instead of

using Table II, this reduction may be found by multiplying $9^s.8296$ by the ho
and parts of an hour of the sidereal interval from noon.

As examples of the use of page II:—

1.—Let the Sun's right ascension and the equation of time be required
1914, July 13, $10^h\ 3^m\ 30^s$, A. M., mean time, at a place whose longitude is 85° 1
or $5^h\ 41^m\ 0^s$ west of Greenwich.

		h m s
Local astronomical mean time	July 12,	22 3 30
Longitude from Greenwich (additive)		5 41 0
Greenwich mean time	July 13,	3 44 30=$3^h.7417$

Sun's Right Ascension.	h m s	*Equation of Time.*	m s
July 13, Greenwich noon	7 27 31.24	July 13, Greenwich noon	5 25.67 (subtracti
H. D. $10^s.164\times3.7417$	+ 38.03	H. D.$+0^s.308\times3.7417$.	+ 1.15
	7 28 9.27		5 26.82

In this case the hourly differences interpolated to half the interval, or $1^h.87$ after noon, ha
been used. The equation of time is here subtractive from mean time. Its reduction could ha
been found by Table 12 of BOWDITCH's *Navigator.*

2.—If the sidereal time is required for the same time and place, we have—

	h m s
July 13, sidereal time (at Greenwich mean noon)	7 22 5.56
Reduction for $3^h\ 44^m\ 30^s$ from Table III, or $9^s.8565\times3.7417$.	+ 36.88
Add the local astronomical mean time	22 3 30.00
The required sidereal time is (rejecting 24^h)	5 26 12.44

3.—On 1914, July 13, A. M., at a place whose longitude is 85° 15′ W., suppo
the sidereal time to be $5^h\ 26^m\ 12^s.44$ and that the corresponding mean time
required.

The astronomical day is July 12; the longitude in time, $+5^h\ 41^m\ 0^s$, or $+5^h.6833$

		h m s
July 12, sidereal time (at Greenwich mean noon)		7 18 9.01
Reduction for $5^h\ 41^m\ 0^s$ from Table III, or $9^s.8565\times5.6833$.		+ 56.02
The sidereal time of local mean noon		7 19 5.03
The given sidereal time ($+24^h$, if necessary for the following subtraction)		29 26 12.44
Subtracting the first from the second gives the sidereal interval from noon		22 7 7.41=$22^h.1187$
Reduction for $22^h\ 7^m\ 7^s.41$ from Table II, or$-9^s.8296\times22.1187$		− 3 37.42
The required astronomical mean time is .	July 12,	22 3 29.99

Page III contains, for Greenwich mean noon of each day, *The Sun's Tr*
Longitude and *Latitude*, and the *Logarithm of the Radius Vector of the Earth.* Th
longitudes of the Sun are the true geometric longitudes, not corrected for aberr
tion. They are given in two columns, headed, respectively, λ and λ′; λ representin
the Sun's longitude counted from the true equinox of the date; and λ′, the sam
coordinate counted from the mean equinox of the beginning of the Besselian ficti
tious year. The latitude is referred to the mean ecliptic of the date. Columns o
hourly differences are given to facilitate finding the Sun's longitude, or the logarithm
of the radius vector, for any hour from noon.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich. It may be reduced to any meridian, or to any Greenwich sidereal time, by using the hourly difference, $-9^s.8296$, to effect the necessary interpolation. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time, or from Table 8 of BOWDITCH's *Navigator.*

This column may be used in converting sidereal time to mean time instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for July 11; that is, the preceding astronomical day.

	h	m	s
July 12, the mean time of Greenwich sidereal noon is	16	39	6.86
Reduction for longitude from Table II, or $-9^s.8296\times5.683$ . .			−55.86
The mean time of local sidereal noon	16	38	11.00
Add the given sidereal time	5	26	12.44 $=5^h.4368$
The sum is	22	4	23.44
Reduction for $5^h\ 26^m\ 12^s.44$ from Table II, or $-9^s.8296\times5.4368$.			−53.44
The required astronomical mean time . . July 12,	22	3	30.00

Page IV contains *The Moon's Semidiameter* and *Equatorial Horizontal Parallax* for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of that quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the Sun's declination and the equation of time in the preceding examples. The sign plus or minus is prefixed to the hourly differences, according as the horizontal parallax is increasing or decreasing.

The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.2725 (see p. xi), or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1914, March 10, 7^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is $5''.4$; then,

$$12^h : 7^h = 5''.4 : 3''.2$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The Moon's semidiameter for March 10, 7^h, is therefore $16'\ 31''.4$.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon. When great precision is needed, the hourly differences should be interpolated for half the interval of Greenwich time from noon or midnight, and the horizontal parallax should be corrected for the latitude of the place of observation.

The mean time of *The Moon's Upper Transit* at Greenwich and the *Age of the Moon* are also contained on page IV. The time of transit is given to tenths of a minute, and is accompanied by a column of differences for one hour of longitude, by means of which the local time of the Moon's meridian transit may be computed for any other place whose longitude is known. Table 11 of BOWDITCH's *Navigator* furnishes the necessary reduction by simple inspection. The age of the Moon, or the time elapsed since the preceding new Moon, is given to tenths of a day.

Pages V–XII contain *The Moon's Right Ascension* and *Declination* for each day and hour of Greenwich mean time. They are accompanied by columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may either be taken from a well-regulated chronometer, or may be obtained by applying the longitude, converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Diff. for 1 Minute* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added to or subtracted from the quantity, according as the latter is increasing or decreasing.

Thus, suppose the Moon's right ascension and declination are required for 1914, April 27, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:—

Right Ascension.	h	m	s	*Declination.*		°	′	″
April 27, 10^h	4	3	0.77	. . . . .	N.	25	51	4.6
Diff. $2^s.1994 \times 10.5$ . . .			23.09	$+6''.357 \times 10.5$		+	1	6.7
April 27, $10^h\ 10^m\ 30^s$ . . .	4	3	23.86	. . . . .	N.	25	52	11.3

For the sake of precision, the differences here employed have been interpolated for $5^m.2 = 0^h.09$.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the Earth.

Pages 146–177 contain the geocentric ephemerides of the seven major planets. The places given are apparent positions; that is, they are referred to the equator and true equinox of the date, and are corrected for aberration. All the data except meridian passage are given for the instant of Greenwich mean noon. The column *Meridian Passage* shows the hour, minute, and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that given for the Sun on pages 704–707. The local mean time of meridian passage of any planet, at any place, can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich passage.

Pages 178–199 contain the heliocentric coordinates of the seven major planets, and the logarithms of their distances from the Earth. The *Heliocentric Longitude* is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The *Daily Motion* is given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude counted along the orbit of the planet. The latter is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The *Heliocentric Latitude* is counted from the mean ecliptic of the date. The

Logarithm of Radius Vector is the logarithm of the distance of the center of the planet from that of the Sun, at the Greenwich mean noon whose date is given in the first column. The last two columns give, respectively, the logarithm of the true distance of the center of the planet from that of the Earth, for the Greenwich noon indicated on the left-hand side of the page, and for the time which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean midnight of the same day; in the case of Venus and Mars, it is the mean noon of the day immediately following; in the case of Jupiter and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 200–207 contain the rectangular coordinates of the center of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox of each date as the plane and point of reference. Each coordinate is given both for Greenwich mean noon and for Greenwich mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan. o*, give the corrections to be applied to the coordinates for noon in order to obtain the corresponding coordinates referred to the mean equator and the mean equinox of the beginning of the Besselian fictitious year.

Pages 208–211 contain for every Greenwich mean noon and midnight the apparent geocentric longitude and latitude of the Moon referred to the true ecliptic and equinox of the date.

Page 212 contains the position of the *Moon's Equator*, the *Longitude of the Moon's Perigee*, the *Mean Longitude of the Moon's Ascending Node*, and the *Moon's Mean Longitude*.

Page 213 contains the elements of the *Moon's Libration*, and the *Sun's Aberration and Horizontal Parallax*. The formulæ for finding the libration in longitude and latitude are given on page xii. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the Sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Horizontal Parallax*, given in the last column, is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

Pages 214, 231–232 contain data for precession and the obliquity of the ecliptic, together with all sensible terms arising from the motions of the equator and ecliptic. To show clearly the relations of these quantities, let

λ = the longitude of any body referred to the true equinox of the date.

λ' = the longitude of the same body referred to the mean equinox of the beginning of the Besselian fictitous year.

ψ_1 = the adopted value of the general precession.

$\delta'\psi$ = the principal term of the nutation in longitude; or, in other words, the correction to be applied to the longitude of a body referred to the mean equinox of date, in order to obtain that longitude as referred to the true equinox, exclusive of short period terms. When the correction is positive, the longitudes referred to the true equinox are greater than those referred to the mean equinox; while the contrary is the case when the correction has a negative sign.

$\delta''\psi$ = the short period terms of nutation in longitude, given on pages 231–232.

ω = the true or apparent obliquity of the ecliptic at the date.

ω' = the mean obliquity of the ecliptic at the beginning of the Besselian fictitious year.

$\delta'\omega$ = the principal term of the nutation of the obliquity of the ecliptic; or, in other words, the correction to be applied to the mean obliquity of date in order to find the true or apparent obliquity, exclusive of short period terms. This quantity is tabulated on page 214, and is positive or negative according as the true obliquity is greater or less than the mean obliquity.

$\delta''\omega$ = the short period terms of nutation in obliquity, given on pages 231–232.

τ = the fraction of a year intervening between the instant when the Sun's mean longitude was 280° and the date for which λ or ω is required.

Then—

$$\lambda=\lambda'+\tau\psi_1+\delta'\psi+\delta''\psi$$

$$\omega=\omega'-0''.464\ \tau+\delta'\omega+\delta''\omega$$

Page 214 contains, for each fifth Greenwich mean noon throughout the year, certain quantities which may be described in terms of the above notation as follows: The *Precession in Longitude from 1914.0* = $\tau\psi_1$; the *Nutation in Longitude* = $\delta'\psi$; the *Nutation in Right Ascension* = $(\delta'\psi)$ cos ω'; the *Nutation in Obliquity* = $\delta'\omega$, and the *Obliquity of the Ecliptic* = $\omega - \delta''\omega$, which is the true inclination of the Earth's equator to the ecliptic, exclusive of the terms depending on the Moon's longitude.

PART II.—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Pages 216–217 contain formulæ for reducing the positions of fixed stars, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of the Paris Conference of May, 1896, and expressed in the notation of Bessel.

Pages 218–221 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight, with the values of *E* appended at the bottoms of the pages. The terms of short period have been included. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of *A*, *C*, and *D* are sometimes needed to five places of decimals. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D;* that is, *A* must be interchanged with *C*, and *B* with *D*. Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:

Computation of the apparent place of α Tauri for January 13, 1914, for the upper transit at Washington.

log a	0.5359	log b	7.8692	log c	8.4201	log d	8.8082
log A	9.1127	log B	0.9316n	log C	0.8671n	log D	1.2749
log a'	0.8803	log b'	9.9664n	log c'	9.1929	log d'	9.0275
log Aa	9.6486	log Bb	8.8008n	log Cc	9.2872n	log Dd	0.0831
log Aa'	9.9930	log Bb'	0.8980	log Cc'	0.0600n	log Dd'	0.3024

		h m s		° ′ ″
Mean Place, 1914.0,	$\alpha_0 =$	4 30 59.038	$\delta_0 =$	+16 20 14.12
	$Aa =$	+ 0.445	$Aa' =$	+ 0.98
	$Bb =$	− 0.063	$Bb' =$	+ 7.91
	$Cc =$	− 0.194	$Cc' =$	− 1.15
	$Dd =$	+ 1.211	$Dd' =$	+ 2.01
	$E =$	+ 0.001	$\tau\mu' =$	− 0.01
	$\tau\mu =$	0.000		
Apparent Place, January 13,		4 31 0.438	$\delta =$	+16 20 23.86
	$-f' =$	− 0.013		
	$\alpha =$	4 31 0.425		

Pages 222–229 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. The terms of short period have been included. These quantities are connected with those of Bessel by the relations given on page 216, which also contains the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, a, b, c, d, a', b', c', d', while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:

Computation of the apparent place of α Tauri for January 13, 1914, for the upper transit at Washington.

	h m		° ′
$G =$	19 7.6	$\delta_0 =$	+ 16 20.2
			h m
$\alpha_0 =$	4 31.0	$G+\alpha_0 =$	23 38.6
$H =$	22 34.6	$H+\alpha_0 =$	3 5.6

log $\frac{1}{15}$	8.8239	log $\frac{1}{15}$	8.8239
log g	0.9508	log h	1.3058
sin $(G+\alpha_0)$	8.9696n	sin $(H+\alpha_0)$	9.8598
tan δ_0	9.4670	sec δ_0	0.0179
log (g)	8.2113n	log (h)	0.0074
log g	0.9508	log h	1.3058
cos $(G+\alpha_0)$	9.9981	cos $(H+\alpha_0)$	9.8386
		sin δ_0	9.4492
log (g')	0.9489		
		log (h')	0.5936
log i	0.5044n		
cos δ_0	9.9821		
log (i)	0.4865n		

	h m s
$\alpha_0 =$	4 30 59.038
$f =$	+ 0.386
$(g) =$	− 0.016
$(h) =$	+ 1.017
$\tau\mu =$	0.000
$\alpha =$	4 31 0.425
	° ′ ″
$\delta_0 =$	+ 16 20 14.12
$(g') =$	+ 8.89
$(h') =$	+ 3.92
$(i) =$	− 3.07
$\tau\mu' =$	− 0.01
$\delta =$	+ 16 20 23.85

Page 230 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short-period terms. They are useful in computing ephemerides of stars, similar to those on pages 287–486, for which constants containing short-period terms should not be employed.

Pages 231–232 contain for Washington Mean Midnight of each day the short-period terms of the nutation in longitude and obliquity, for use in connection with the formulæ on page 217, and the coefficients mentioned below, which are given for each star on pages 287–486.

Pages 233–250 contain the mean places of eight hundred and twenty-five stars, for the beginning of the Besselian fictitious year, or, in other words, for the moment when the Sun's mean longitude is 280°. The annual variations are to be considered as the differential coefficients of each coordinate with respect to the time at the beginning of the year.

Pages 251–286 contain the apparent positions of fifteen northern circumpolar stars for every upper transit at Washington. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 251 we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit following that of July 1 (page 257) does not take place until July 2.3. Hence the lower transit of July 1 precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Mean Solar Date.*

The secant and tangent of the apparent declination for the 15th of each month and the mean place in right ascension and declination for the beginning of the year are given for each star at the foot of the page.

Pages 287–486 contain, for every tenth upper transit at Washington, the apparent places of 800 stars, being all those given in the list of mean places, except the twenty-five circumpolars. The mean solar date in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each coordinate are given for every ten days.

In connection with the ephemeris of each 10-day star there are given at the foot of the page, (1) the secant and the tangent of the mean of the star's greatest and least apparent declinations during the year, (2) the seconds of the mean place in both right ascension and declination for the beginning of the year, and (3) the coefficients of the short-period terms of the nutation, the use of which is explained on page 217.

Pages 487–510 contain ephemerides of ten southern circumpolar stars in all respects similar to those of northern circumpolar stars on pages 251–286.

Pages 511–517 contain the mean errors for 1920 in both right ascension and declination of the places of the 825 stars on pages 233–250 taken from *Astronomical Papers of the American Ephemeris*, Vol. VIII, Part 2, pages 370–382. They furnish data for estimating approximately the accuracy of the Mean Places of the Stars on pages 233–250.

Pages 518–525 contain the *Apparent Right Ascension* and *Declination* of the Sun, both for Washington mean and apparent noon, and the *Hourly Motion* of the Sun in these coordinates; the *Equation of Time*, the *Semidiameter* of the Sun, and the *Sidereal Time of Semidiameter Passing Meridian*, for Washington apparent noon; and, lastly, the *Sidereal Time of Mean Noon*. The hours and minutes of right ascension and the degrees and minutes of declination are always made the same for both mean and apparent noon. In cases where they really differ, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that the sum of the two remains correct. The hourly motions in right ascension and declination are given for the columns headed *Mean Noon*, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich*.

Pages 526–541 contain the right ascension, declination, semidiameter, and parallax of the Moon at the moment of upper and lower transit over the meridian of Washington. The mean time given in the third column is that of transit of the Moon's center over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington would exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the Moon in right ascension were uniform, or, in other words, they are differential coefficients corresponding to the instants of Washington transit. By means of them, when second differences are taken into account, the position of the Moon can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let F represent either the *Mean Time of Transit*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let D represent the corresponding *Difference for One Hour of Longitude*. Write down three successive values of F, together with the corresponding values of D, and difference the latter as in the following scheme; where the middle values, F_0 and D_0, belong to the culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ:—

Function.	Diff. for 1 Hour of Longitude.	Δ'	Δ''
F_{-1}	D_{-1}	a'	
F_0	D_0	a''	b
F_{+1}	D_{+1}		

Then, for the culmination at the meridian λ

$$F_\lambda = F_0 + \lambda D_0 + \frac{\lambda^2}{48}(a' + a'') + \frac{\lambda^3 b}{864}$$

where λ must be expressed in hours and decimals of an hour, and reckoned from Washington or from 180° from Washington according as the upper or lower culmination is used for the middle value (F_0). Adding twelve hours to the Washington time of lower transit at Washington gives the local time of upper transit at places whose longitude is 180° from Washington.

The columns of *Sidereal Time of Semidiameter Passing Meridian, Geocentric Semidiameter* and *Equatorial Horizontal Parallax* need no explanation, except that they are all given for the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within 1″ of the opposite limb, both can be well observed, and in such cases both are indicated, the defective limb being indicated by an italic letter or numeral, and the correction for defective illumination (as seen from Washington) being given in a foot-note.

Pages 542–558 contain for each of the seven major planets, the geocentric *Apparent Right Ascension* and *Declination*, the *Horizontal Parallax, Semidiameter*, and *Sidereal Time of Semidiameter Passing Meridian*, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The columns following the dates give the Washington mean times of these transits. The stellar magnitude at opposition for Mars, Jupiter, Saturn, Uranus, and Neptune, respectively, is given at the bottom of the page containing the ephemeris of the planet.

PART III.—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Washington mean time, except in the case of the eclipses, which are expressed in Greenwich mean time.

Pages 560–565 contain all necessary data respecting the solar and lunar eclipses and a transit of Mercury which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51:50. The principal circumstances of each total and annular eclipse are stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

The line entitled "Central eclipse at noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1914, August 20–21, begins and ends at Kief, Russia, latitude 50° 27′ N., longitude 30° 30′ E.

For the beginning we compare the distance of the place from the curves of 23^h and 24^h, and find it to correspond to about 30 minutes from the former, thus giving for the approximate time of beginning $23^h\ 30^m$; for the end we compare the distance of the place from the curves of 1^h and 2^h, and find it to be about 50 minutes from the former, thus giving for the approximate time of ending $1^h\ 50^m$, and both of these results are probably correct to within 3 or 4 minutes.

Changing to local mean time, we shall have—

		Beginning.			*Ending.*		
		d	h	m	d	h	m
Greenwich mean time	August	20	23	30	21	1	50
Longitude east			2	2		2	2
Local mean time	August	21	1	32	21	3	52

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relatively to the central line and to the limit. On the central line the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit; the measurements being made upon a line drawn through the place, perpendicularly to the central line.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of xy. We take the intersection of this plane with that of the Earth's equator as the axis of x, and the center of the Earth as the origin of coordinates. The axis of y is perpendicular to that of x, and directed toward the north; x and y are then the coordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra, or annulus. The notation is that of CHAUVENET's *Spherical and Practical Astronomy*, in which l_2 is regarded as positive for an annular and negative for a total eclipse.

The angles f_1 and f_2, the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semiangles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x', y', and μ', which are the changes of x, y, and μ, in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that at the moments of beginning and ending the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find this distance and radius we proceed as follows:—

(1) The coordinates of the observer, ξ, η, and ζ, together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The coordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric coordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth and φ' the geocentric latitude. These coordinates may be obtained from geodetic tables, or may be computed from the following table based on CLARKE's spheroid of 1866, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Coordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000		0.00295	
		1		1
5	0.00001		0.00294	
		3		3
10	0.00004		0.00291	
		6		6
15	0.00010		0.00285	
		7		7
20	0.00017		0.00278	
		9		9
25	0.00026		0.00269	
		11		11
30	0.00037		0.00258	
		11		11
35	0.00048		0.00247	
		13		13
40	0.00061		0.00234	
		13		13
45	0.00074		0.00221	
		12		12
50	0.00086		0.00209	
		13		13
55	0.00099		0.00196	
		12		12
60	0.00111		0.00184	
		10		10
65	0.00121		0.00174	
		9		9
70	0.00130		0.00165	
		8		8
75	0.00138		0.00157	
		5		5
80	0.00143		0.00152	
		3		3
85	0.00146		0.00149	
		1		2
90	0.00147		0.00147	

For the assumed Greenwich mean time of computation, take from the table elements the values of sin d, cos d, and μ. Then, with λ for the longitude west m Greenwich, the coordinates of the observer will be—

$$\xi=\rho\cos\varphi'\sin(\mu-\lambda)$$
$$\eta=\rho\sin\varphi'\cos d-\rho\cos\varphi'\sin d\cos(\mu-\lambda)=\eta_1-\eta_2$$
$$\zeta=\rho\sin\varphi'\sin d+\rho\cos\varphi'\cos d\cos(\mu-\lambda)=\zeta_1+\zeta_2$$

d their variations in one minute of mean time will be—

$$\xi'=[7.63992]\,\rho\cos\varphi'\cos(\mu-\lambda)$$
$$\eta'=[7.63992]\,\rho\cos\varphi'\sin d\sin(\mu-\lambda)=[7.63992]\,\xi\sin d$$

ζ' is not needed.

(2) For the same assumed moment of Greenwich mean time, take from the les of elements the coordinates x and y of the axis of the shadow, together with ir variations for one minute, which are equal to one-tenth of the differences of o consecutive numbers. These variations are represented by x' and y', and their arithms are given beneath the tables of x and y.

(3) The distance m and position-angle M of the axis of the shadow relatively the observer, and the relative motions, n and N, are computed by the formulæ—

$$m\sin M=x-\xi$$
$$m\cos M=y-\eta$$
$$n\sin N=x'-\xi'$$
$$n\cos N=y'-\eta'$$

(4) Both for the shadow and for the penumbra, the radius L at the distance ζ m the fundamental plane is computed by the formula—

$$L=l-\zeta\tan f$$

nd f being found from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ding of the eclipse, we shall have—

$$m=L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M-N)}{L}$$

There will be two values for this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth quadrant when $\sin \psi$ is negative; but simplicity will be gained by taking only that value of ψ for which $\cos \psi$ is positive. This value lies between the limits $+90^\circ$ and -90°. The correction τ to the assumed time of beginning or ending of the eclipse will then be found, in minutes, from—

$$\tau = -\frac{m \cos (M-N)}{n} \mp \frac{L \cos \psi}{n}$$

where the double sign is to be taken negative for the beginning and positive for the ending.

However, one such pair of values of τ can not give the times of both beginning and ending with accuracy. To attain that, we must commence the computation by assuming two times, one near the beginning and the other near the ending of the eclipse, both of which may be derived from the chart with sufficient exactness. The computation for the first assumed time will give a small value of τ which, when applied to the assumed time, will give the beginning of the eclipse nearly correctly, and a large value which will give an inaccurate time of ending. Similarly the computation for the second assumed time will give a small and nearly correct value of τ for finding the time of ending, and a large and inaccurate negative value for finding the time of beginning. We shall thus deduce two times of each phase, only one of which is to be regarded as approximately correct.

The more accurate times of beginning and ending may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors, but a second approximation may be obtained without it, by finding a corrected value of τ in accordance with the formulæ—

$$\delta\tau = \mp \frac{\tau(l' + [5.3100]\xi \cos d)}{n \cos \psi} - \frac{[4.9788]\tau^2}{n \cos \psi}[\xi \sin (N \mp \psi) - \eta_2 \cos (N \mp \psi)]$$

$$\tau_0 = \tau + \delta\tau$$

where the double signs are to be taken negative for the beginning of the eclipse and positive for the ending. l' is the variation of l for one minute of time, and its numerical value can be taken by inspection from the table of Besselian elements.

If the resulting values of τ_0 are not greater than fifteen minutes, the corrected times of contact thus obtained will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction. To guard against numerical mistakes it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, the computer must use his own judgment as to making further corrections and computations.

Position-angle of Point of Contact.—The position-angle P, of the point of con-ct, reckoned from the north point of the Sun's limb toward the east, is found by e formulæ—

$$P = N - \psi \pm 180^\circ \text{ for the beginning,}$$

$$\text{or} \quad P = N + \psi \quad \text{for the ending,}$$

being assumed that, in each case, the value of ψ is taken between the limits $\pm 90^\circ$.

Computation of the Solar Eclipse of 1914, August 20–21, for Kief, Russia.

The position of Kief is—

	°	′	″
Latitude, $\varphi =$	+50	27	0
Longitude, $\lambda =$	−30	30	0

Its geocentric coordinates are—

$$\rho \sin \varphi' = 9.88501$$

$$\rho \cos \varphi' = 9.80484$$

From the Eclipse Chart we find the approximate times of the phases to be—

	d	h	m	
Beginning August	20	23	30	Greenwich Mean Time.
Ending	21	1	50	

	Beginning.	Ending.
Greenwich Mean Time, T, August	$20^d\ 23^h\ 30^m$	$21^d\ 1^h\ 50^m$
	° ′ ″	° ′ ″
μ	351 41 54	26 42 30
λ	−30 30 0	−30 30 0
$\mu - \lambda$	22 11 54	57 12 30
$\rho \cos \varphi'$	9.80484	9.80484
$\sin (\mu - \lambda)$	9.57728	9.92461
$\log \xi$	9.38212	9.72945
ξ	+0.24106	+0.53635
$\rho \sin \varphi'$	9.88501	9.88501
$\cos d$	9.98987	9.98992
$\log \eta_1$	9.87488	9.87493
η_1	+0.74968	+0.74977
$\rho \cos \varphi'$	9.80484	9.80484
$\sin d$	9.32942	9.32835
$\cos (\mu - \lambda)$	9.96656	9.73367
$\log \eta_2$	9.10082	8.86686
η_2	+0.12613	+0.07360
$\eta = \eta_1 - \eta_2$	+0.62355	+0.67617
$\rho \sin \varphi' \sin d$	9.21443	9.21336
ζ_1	+0.16384	+0.16344
$\rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.76127	9.52843
ζ_2	+0.57712	+0.33762
$\zeta = \zeta_1 + \zeta_2$	+0.74096	+0.50106
const. log	7.63992	7.63992
$\rho \cos \varphi' \cos (\mu - \lambda)$	9.77140	9.53851
$\log \xi'$	7.41132	7.17843

	Beginning.	Ending.
ξ'	+0.002578	+0.001508
const. log	7.63992	7.63992
$\xi \sin d$	8.71154	9.05780
$\log \eta'$	6.35146	6.69772
η'	+0.000225	+0.000499
$x-\xi$	−0.45168	+0.43614
$y-\eta$	+0.32738	−0.29589
$x'-\xi'$	+0.005874	+0.006941
$y'-\eta'$	−0.004296	−0.004579
$m \sin M$	9.65483 n	9.63963
$m \cos M$	9.51505	9.47113 n
$\tan M$	0.13978 n	0.16850 n
M	305° 56′ 5″	124° 9′ 13″
$\cos M$	9.76853	9.74928 n
$\log m$	9.74652	9.72185
$n \sin N$	7.76893	7.84142
$n \cos N$	7.63306 n	7.66077 n
$\tan N$	0.13587 n	0.18065 n
N	126° 10′ 48″	123° 24′ 47″
$\sin N$	9.90696	9.92154
$\log n$	7.86197	7.91988
$\tan f$	7.66487	7.66488
$\log \zeta$	9.86980	9.69989
	7.53467	7.36477
$\zeta \tan f$	+0.00343	+0.00232
l	+0.54028	+0.54003
L	+0.53685	+0.53771
$M-N$	179° 45′ 17″	0° 44′ 26″
$\sin (M-N)$	7.63153	8.11142
$\log m$	9.74652	9.72185
$\operatorname{colog} L$	0.27015	0.26945
$\sin \psi$	7.64820	8.10272
ψ	0° 15′ 18″	0° 43′ 33″
$\log \frac{m}{n}$	1.88455	1.80197
$\cos (M-N)$	0.00000 n	9.99996
	1.88455 n	1.80193
$-\frac{m}{n} \cos (M-N)$	+76.657	−63.377
$\operatorname{Log} L$	9.72985	9.73055
$\cos \psi$	0.00000	9.99996
$\operatorname{colog} n$	2.13803	2.08012
	1.86788	1.81063

	Beginning.	Ending.
$\mp\dfrac{L\cos\psi}{n}$	−73.770	+64.659
τ	m + 2.887	m + 1.282
$T+\tau$	d h m 20 23 32.887	d h m 21 1 51.282

We compute the correction $\delta\tau$ for the beginning as follows:

	Beginning.		Beginning.
const. log	5.3100	$\cos(N-\psi)$	9.7683 *n*
$\log\xi$	9.3821	$\log\eta_2$	9.1008
$\cos d$	9.9899	$\log\eta_2\cos(N-\psi)$	8.8691 *n*
	4.6820	$\xi\sin(N-\psi)$	+0.1952
number	+0.0000048	$\eta_2\cos(N-\psi)$	−0.0740
l'	−0.0000012	diff.	+0.2692
sum	+0.0000036		
log (sum)	4.5563	log (diff.)	9.4301
$\log\tau$	0.4604	const. log	4.9788 *n*
colog n	2.1380	$\log\tau^2$	0.9208
$\sec\psi$	0.0000	colog $(n\cos\psi)$	2.1380
	7.1547		7.4677 *n*
(1)	+0.0014	(2)	−0.0029
$N-\psi$	125° 55′		
$\sin(N-\psi)$	9.9084	$-(1)+(2)=\delta\tau$	m −0.004
$\log\xi$	9.3821	τ	+2.887
$\log\xi\sin(N-\psi)$	9.2905	τ_0	+2.883

The corrected time of beginning is, therefore,

$$T_0 = \text{August } 20^{d}\ 23^{h}\ 32^{m}.883$$

Whence we find—

		Beginning.	Ending.
		d h m	d h m
Greenwich Mean Time,	August	20 23 32.883	21 1 51.282
λ		− 2 2.000	− 2 2.000
Local Mean Time,	August	21 1 34.883	21 3 53.282

Therefore we have—

		d h m s	
Beginning of the Eclipse,	August	21 1 34 53.0	Local Mean Time.
End of the Eclipse,	August	21 3 53 16.9	

	Beginning.	Ending.
	° ′	° ′
$N\mp\psi$	125 55.5	124 8.3
constant	180 0.0	0 0.0
Angle of position: P	305 55.5	124 8.3

rom the north point of the Sun's disk toward the east for direct image.

Pages 566–569 contain the adopted mean places and annual proper motions f such stars as bright as magnitude 6.5 as will be occulted during the year by the loon.

Pages 570–606 contain the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of coordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1914.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1914 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:

The *Washington Mean Time* is the moment, T, at which the two bodies are in geocentric conjunction in right ascension. At that moment the coordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle*, H, gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the coordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star relatively to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H-\lambda$, taken without regard to sign, must be less than the semidiurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon at the local mean time $T-\lambda$, unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations, to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H-\lambda$ or $T-\lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

T = the instant of geocentric conjunction of Moon and star in right ascension, expressed in Washington mean solar time;
H = the Washington west hour-angle of the two bodies at that moment;
λ = the longitude west of Washington;
$h_0 = H - \lambda$ = the local hour-angle of the star at the instant T;
δ = the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric coordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 716.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction taken from Mr. DOWNES's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol t. It will have the same sign as h_0.

When DOWNES's table is not available, the correction may be computed from the formulæ,

$$\xi_0 = \rho \cos \varphi' \sin h_0$$

$$\xi' = [9.4192]\, \rho \cos \varphi' \cos \frac{4}{3} h_0$$

$$t = \frac{\xi_0}{x' - \xi'}$$

By applying t to the Washington mean time of geocentric conjunction, as given with the elements, we shall have the Washington mean time of local conjunction within a few minutes.

(2) Compute for the instant $T + t$ the following quantities, in which t_0 is the sidereal equivalent of the mean time interval t:

$$\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + t_0) \\
\eta &= \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) = \eta_1 - \eta_2 \\
\xi' &= [9.4192]\, \rho \cos \phi' \cos (h_0 + t_0) \\
\eta' &= [9.4192]\, \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) = [9.4192]\, \xi \sin \delta \\
x &= x't \\
y &= Y + y't
\end{aligned}$$

Compute also m, M, n, N, and ψ from the equations,

$$\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \xi' \\
n \cos N &= y' - \eta' \\
\sin \psi &= [0.5646]\, m \sin (M - N)
\end{aligned}$$

ψ being taken between the limits ±90°. Finally compute,

$$\tau = -\frac{[1.7782]m}{n}\cos(M-N) \mp \frac{[1.2135]}{n}\cos\psi$$

$$\delta\tau = \frac{[6.7591]\tau^2}{n\cos\psi}[\eta_2\cos(N\mp\psi) - \xi\sin(N\mp\psi)]$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated respectively τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Washington mean times of the phases,

$$\text{Instant of immersion} = T + t + \tau' + \delta\tau'$$
$$\text{Instant of emersion} = T + t + \tau'' + \delta\tau''$$

These expressions are practically exact, as the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results, it will be advisable to compute ξ, η, x, and y for the times of immersion and emersion finally obtained. If these times are correct the quantities in question will fulfill the condition,

$$\sqrt{(x-\xi)^2 + (y-\eta)^2} = 0.2725$$

If log m sin $(M-N) > 9.4354$, sin ψ will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semidiameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P. It is computed from the formulæ,

$$P = N - \psi + \delta P \qquad \text{for immersion,}$$
$$\text{or} \qquad P = N + \psi + \delta P \pm 180° \text{ for emersion,}$$

where the angles $N-\psi$ and $N+\psi$ are taken directly from the computation of $\delta\tau$, and δP is found in degrees of arc from the expression,

$$\delta P = \mp\frac{[7.3038]\tau^2}{\cos\psi}[\eta_2\sin N + \xi\cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V, is also reckoned in the direction from the north toward the east, and is found from the formula,

$$V = P - C$$

where C is computed from the expression,

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]\tau^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]\tau^2\eta_2}$$

C being taken less or greater than 180°, according as the numerator is positive or negative.

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instruc-ns are given for constructing three special tables which greatly diminish the bor of computing occultations, but as these tables should contain from 4700 to 00 quantities, and as they would apply only to the place for which they were mputed, it will rarely be worth while to undertake the labor of forming them. ose who desire further information on the subject may consult any one of the lumes in question.

As an example of an isolated occultation, we will compute that of ψ Virginis June 3, 1914, for Philadelphia, whose position is—

$$\varphi = +39^\circ\ 58'\ 2''.1$$
$$\lambda = -\ 0^h\ 7^m\ 9^s.2$$

d whose geocentric coordinates are—

$$\rho \sin \varphi' = 9.8054$$
$$\rho \cos \varphi' = 9.8851$$

om the elements on page 584 we have,

$$\begin{aligned} & \quad\ \ {}^{h}\quad {}^{m} \\ T &= \ \ 7\ 21.4 \\ H &= -0\ 42.1 \\ h_0 = H - \lambda &= -0\ 34.9 \end{aligned}$$

From the formulæ on page 723, we find the correction, t, to the Washington an time of geocentric conjunction, T, to be about $-0^h\ 20^m.4$; therefore the ashington mean time of apparent conjunction is—

$$T+t = \text{June } 3^d\ 7^h\ 1^m.0$$

ψ Virginis.	Apparent Declination. ° ′	W. T. of ☌ d h m	Hour Angle. h m	Y	x'	y'
	−9 4.6	June 3 7 21.4	−0 42.1	+0.6225	0.5394	−0.2753

$T+t$ June	$3^d\ 7^h\ 1^m.0$	η_2	−0.1176
h_0	−0 34.9	$\eta_1 - \eta_2 = \eta$	0.7484
t_0	−0 20.5	const. log	9.4192
$h_0 + t_0$	−0 55.4	$\rho \cos \varphi' \cos (h_0 + t_0)$	9.8723
$\rho \cos \varphi'$	9.8851	$\log \xi'$	9.2915
$\sin (h_0 + t_0)$	9.3791 n	ξ'	+0.1956
$\log \xi$	9.2642 n	const. log	9.4192
ξ	−0.1838	$\xi \sin \delta$	8.4622
$\rho \sin \varphi'$	9.8054	$\log \eta'$	7.8814
$\cos \delta$	9.9945	η'	+ .0076
$\log \eta_1$	9.7999	$\log x'$	9.7319
η_1	0.6308	$\log t$	9.5320 n
$\rho \cos \varphi'$	9.8851	$\log x$	9.2639 n
$\sin \delta$	9.1980 n	x	−0.1836
$\cos (h_0 + t_0)$	9.9872	$\log y'$	9.4398 n
$\log \eta_2$	9.0703 n	$\log y't$	8.9718

$T+t$ June	3^d 7^h $1^m.0$
$y't$	$+0.0937$
Y	$+0.6225$
y	0.7162
$x-\xi$	$+0.0002$
$y-\eta$	-0.0322
$x'-\xi'$	$+0.3438$
$y'-\eta'$	-0.2829
$m \sin M$	6.3010
$m \cos M$	$8.5079\,n$
$\tan M$	$7.7931\,n$
M	$179^\circ\ 39'$
$\cos M$	$0.0000\,n$
$\log m$	8.5079
$n \sin N$	9.5363
$n \cos N$	$9.4516\,n$
$\tan N$	$0.0847\,n$
N	$129^\circ\ 27'$
$\sin N$	9.8877
$\log n$	9.6486

const. log	0.5646
$\log m$	8.5079
$\sin (M-N)$	9.8855
$\sin \psi$	8.9580
ψ	$+5^\circ\ 13'$
const. log	1.7782
$\log \frac{m}{n}$	8.8593
$\cos (M-N)$	9.8063
	0.4438
$-\frac{[1.7782]m}{n}\cos (M-N)$	$-\ 2.78$
const. log	1.2135
$\operatorname{colog} n$	0.3514
$\cos \psi$	9.9982
	1.5631
$\mp\frac{[1.2135]\cos \psi}{n}$	∓ 36.57
	m
τ for immersion	-39.35
τ for emersion	$+33.79$

The computation of $\delta\tau$ for the two contacts is as follows:

			Immersion.	Emersion.
$N\mp\psi$			$124^\circ\ 14'$	$134^\circ\ 40'$
$\cos (N\mp\psi)$			$9.7502\,n$	$9.8469\,n$
$\log \eta_2$			$9.0703\,n$	$9.0703\,n$
$\log (1)$			8.8205	8.9172
(1)			$+0.0662$	$+0.0826$
$\sin (N\mp\psi)$			9.9174	9.8520
$\log \xi$			$9.2642\,n$	$9.2642\,n$
$\log (2)$			$9.1816\,n$	$9.1162\,n$
(2)			-0.1519	-0.1307
$(1)-(2)$			$+0.2181$	$+0.2133$
$\log [(1)-(2)]$			9.3387	9.3290
const. log			6.7591	6.7591
$\log \tau^2$			3.1898	3.0576
$\operatorname{colog} (n \cos \psi)$			0.3532	0.3532
$\log \delta\tau$			9.6408	9.4989
			m	m
$\delta\tau$			$+\ 0.44$	$+\ 0.32$
$\tau+\delta\tau$			$-\ 38.91$	$+\ 34.11$
		d	h m	h m
$T+t$	June	3	7 1.0	7 1.0
Washington Mean Time of Phase,	"	3	6 22.1	7 35.1
λ			-0 7.2	-0 7.2
Philadelphia Mean Time,	June	3	6 29.3	7 42.3

To find δP and P:

$\log \eta_2$	$9.0703\,n$	$\log \xi$	$9.2642\,n$	(3)	-0.0908
$\sin N$	9.8877	$\cos N$	$9.8030\,n$	(4)	$+0.1168$
$\log (3)$	$8.9580\,n$	$\log (4)$	9.0672	(3) + (4)	$+0.0260$

	Immersion.	Emersion.
$\log [(3)+(4)]$	8.4150	8.4150
const. log	$7.3038\,n$	7.3038
$\log \tau^2$	3.1898	3.0576
colog $\cos \psi$	0.0018	0.0018
$\log \delta P$	$8.9104\,n$	8.7782
	°	°
δP	$-\ 0.1$	$+\ 0.1$
$N \mp \psi$	124.2	134.7
constant	0.0	180.0
Angle of position: P	124.1	314.8

from the north point of the Moon's limb toward the east, for direct image.

Pages 606–608 contain in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

Page 609 contains the *Ephemeris for Physical Observations of the Sun.*

Pages 610–617 contain the *Ephemeris for Physical Observations of the Moon.* The selenographic longitudes are measured in the plane of the Moon's equator, the axis of reference being the radius of the Moon which passes through the mean center of the visible disk, positive toward the west—i. e., toward Mare Crisium—and the latitudes are measured from the Moon's equator, positive toward the north—i. e., in the hemisphere containing Mare Serenitatis.

The optical and physical librations in longitude and latitude have been computed with elements and formulæ given on pages xi and xii, and their sums are given in the second and third columns, respectively, the physical libration being given separately in the fourth and fifth columns. The Sun's selenographic colongitude (90° − longitude) and latitude and the position-angle of the Moon's axis, C, in the sixth, seventh, and eighth columns, respectively, have all been corrected for the effect of physical libration.

When the libration in longitude is positive, the mean center of the disk is displaced toward the east—that is, the region thus exposed to view is on the west limb—and when the libration in latitude is positive the mean center of the disk is displaced toward the south—that is, the region thus exposed to view is on the north limb.

The altitude of the Sun, A, at any given time above the horizon of any point on the Moon whose selenographic longitude and latitude, λ and β, are known, may be computed from the following formula, the Sun's selenographic longitude and latitude being denoted by $l_\odot$ and $b_\odot$, respectively:

$$\sin A = \sin b_\odot \sin \beta + \cos b_\odot \cos \beta \cos (l_\odot - \lambda)$$

Pages 618–619 contain the data with reference to the illuminated disks of Mercury and Venus. The angle θ is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, measured in the direction west, north, east, south. It is measured from 0° to 360°. We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Pages 620–623 contain the *Ephemeris for Physical Observations of Mars.* The quantities here given have been corrected for aberration, so that in using them they should be interpolated to the actual time of observation.

P is the position-angle of the axis of rotation measured eastward from the north point of the disk.

$A_{\oplus}$ and $A_{\odot}$ are the planetocentric right ascensions of the Earth and Sun, respectively, measured in the plane of the planet's equator from its vernal equinox.

$D_{\oplus}$ and $D_{\odot}$ are the planetocentric declinations of the Earth and Sun, respectively, referred to the planet's equator.

$\odot_{♂}$ is the planetocentric longitude of the Sun measured in the plane of the planet's orbit from its vernal equinox.

k is the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i is the angle between the Sun and the Earth as seen from the planet.

q is the angular value of the greatest defect of illumination as seen from the Earth.

Q is the position-angle of the radius of the disk which passes through the point of greatest defect of illumination—that is, of the radius perpendicular to the line joining the cusps. It is measured eastward from the north point of the disk.

The column headed *Central Meridian* contains the longitude of the meridian which bisects the disk, measured from the adopted zero meridian.

The columns headed *Transit of Zero Meridian* contain the Washington Mean Time of every transit of the zero meridian across the actual center of the disk.

Page 624 contains, for the *Satellites of Mars,* the diagram of their orbits and the times of their elongations.

Pages 625–628 contain the *Ephemeris for Physical Observations of Jupiter.*

The columns headed *Central Meridian* contain the longitudes of the meridian which bisects the disk, measured from the adopted zero meridian for the equatorial region and from the meridian of the Great Red Spot, respectively.

The column headed *Correction for Phase* contains the corrections to be applied to the longitudes of the central meridian to obtain the longitudes of the meridian bisecting the illuminated disk.

The column headed *Transit of Zero Meridian* contains the Washington Mean Time of every fifth transit of the zero meridian across the center of the illuminated disk.

The column headed *Transit of Great Red Spot* contains the Washington Mean Time of every fifth transit of the meridian through the Great Red Spot across the center of the illuminated disk.

The remaining quantities used on pages 625–626 are the same as those defined under the *Ephemeris for the Physical Observations of Mars.*

Pages 629–655 contain, concerning the *Satellites of Jupiter,* the times of conjunction of Satellites I–IV, the times of elongation of Satellite V, the differences in right ascension and declination between Jupiter and Satellites VI and VII, and the phenomena of the Satellites I–IV together with their configurations.

Page 656 contains the *Magnitude of Saturn* and the *Elements of the Rings*.

Pages 657–663 contain, concerning the *Satellites of Saturn*, the diagram of the orbits of the seven inner satellites, the times of elongation for the first eight satellites, the differences in right ascension and declination between Saturn and Phœbe, the ninth satellite, and tables for predicting the position-angles and distances from the center of the planet of the first eight satellites.

Page 664 contains the diagram of the orbits of the satellites of Uranus, together with the times of their elongations.

Pages 665–666 contain tables for predicting the position-angles and distances from the center of the planet of the satellites of Uranus and Neptune.

Page 667 contains the diagram of the orbit of the satellite of Neptune, together with the times of its elongations.

Pages 668–669 contain the *Phenomena*. The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are, respectively, the instants when the longitude of each planet differs from that of the Sun by 0°, ±90°, or 180°. For the conjunction of the planets with the Moon and with each other the predicted times are the instants when the two bodies have the same right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Pages 670–679 contain the *Positions of Observatories*. These have been compiled from various sources, and the data used are the best immediately available. The tabular arrangement is self-explanatory.

Page 680 contains two examples in the computation of lunar distances, which are inserted because the lunar distance tables have been omitted from the American Ephemeris since 1911.

Pages 681–699 contain a series of tables numbered from I to VI.

Table I—*For Finding the Latitude by an Observed Altitude of Polaris.*

Table II—For converting *Sidereal into Mean Solar Time.*

Table III—For converting *Mean Solar into Sidereal Time.*

Table IV—For finding the *Azimuth of Polaris at All Hour Angles.*

Table V—For finding the *Azimuth of Polaris at Elongation.*

Table VI—*For Finding the Times of Upper and Lower Culmination of Polaris.*

The following-named persons were engaged in the preparation of the American Ephemeris and Nautical Almanac for the year 1914:

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